

Service Manual

LCD Monitor E190Sf



Service Manual Versions and Revision

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Dell E190Sf Service Manual

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Chapter 1- PRECAUTIONS & SAFETY NOTICES

1. SAFETY PRECAUTIONS

This monitor is manufactured and tested on a ground principle that a user's safety comes first. However, improper used or installation may cause damage to the monitor as well as to the user.

WARNINGS:

- This monitor should be operated only at the correct power sources indicated on the rating label on the rear cover of the monitor. If you're unsure the power supply in your residence, consult your local dealer or Power Company.
- Use only the specified power cord that comes with this monitor.
- Do not try to repair the monitor by yourself, as it contains no user-serviceable parts. This monitor should only be repaired by a qualified technician.
- Do not remove the monitor cabinet. There is high-voltage parts inside that may cause electric shock to human bodies.
- Stop using the monitor if the cabinet is damaged. Have it checked by a service technician.
- Put your monitor only in a lean, cool, dry environment. If it gets wet, unplug the power cable immediately and consult your closed dealer.
- Always unplug the monitor before cleaning it. Clean the cabinet with a clean, dry cloth. Apply non-ammonia based cleaner onto the cloth, not directly onto the class screen.
- Do not place heavy objects on the monitor or power cord.

2. PRODUCT SAFETY NOTICE

Many electrical and mechanical parts in this chassis have special safety visual inspections and the protection afforded by them cannot necessarily be obtained by using replacement components rated for higher voltage, wattage, etc. Before replacing any of these components read the parts list in this manual carefully. The use of substitute replacement parts, which do not have the same safety characteristics as specified in the parts list, may create shock, fire, or other hazards.

3. SERVICE NOTES

- When replacing parts on circuit boards, clamp the solder wires around terminals before soldering.
- Keep wires away from high voltage, high temperature components and sharp edges.
- Keep wires in their original position so as to reduce interference.
- Adjustment of this product please refers to the user' manual.
- Use Pb free solder wire for circuit board preparation.

Chapter 2- SERVICE TOOLS & EQUIPMENT REQUIRED

1. SIGNAL GENERATOR
2. MULTIMETER
3. SCREW DRIVER
4. OSCILLOSCOPE
5. Soldering IRON
6. SOLDER (Lead free, RoHS compliance)
7. Color Analyzer
8. Fox_VISP_Programmer
9. Fox_VEDID_Programmer

1. Block Diagram

The diagram illustrates the power and control flow in a CCFL inverter system. On the left, a vertical bar represents the 'To Panel CCFL' connection. Two 'Lamp' blocks (Lamp1 and Lamp2) are connected to an 'Inverter Transformer'. The transformer is driven by a 'MOSFET' and an 'Inverter PWM IC'. A 'Feedback Control' block provides input to the PWM IC. The MOSFET is connected to a 'Power Transformer' and a 'Rectifier & Filter Circuit'. The rectifier circuit outputs '+12V DC output' and is connected to a 'Power MOSFET' and a 'Power PWM Control IC'. The power MOSFET is connected to a 'Snubber & Schottky' block, which outputs '+5V DC output'. The power transformer is connected to another 'Snubber & Schottky' block, which outputs '+12V DC output'. The power MOSFET is also connected to a 'Feedback' block, which is connected to a 'Photocoupler' and a 'Power PWM Control IC'. The power PWM control IC is connected to a 'Brightness Control' and an 'ON/OFF Control' line, which are connected to a 'To IF Board' block.

2. Electronic Circuit Theory

2.1 Inverter PWM circuit

2.1.1 Inverter Control circuit operations:(fig.2)

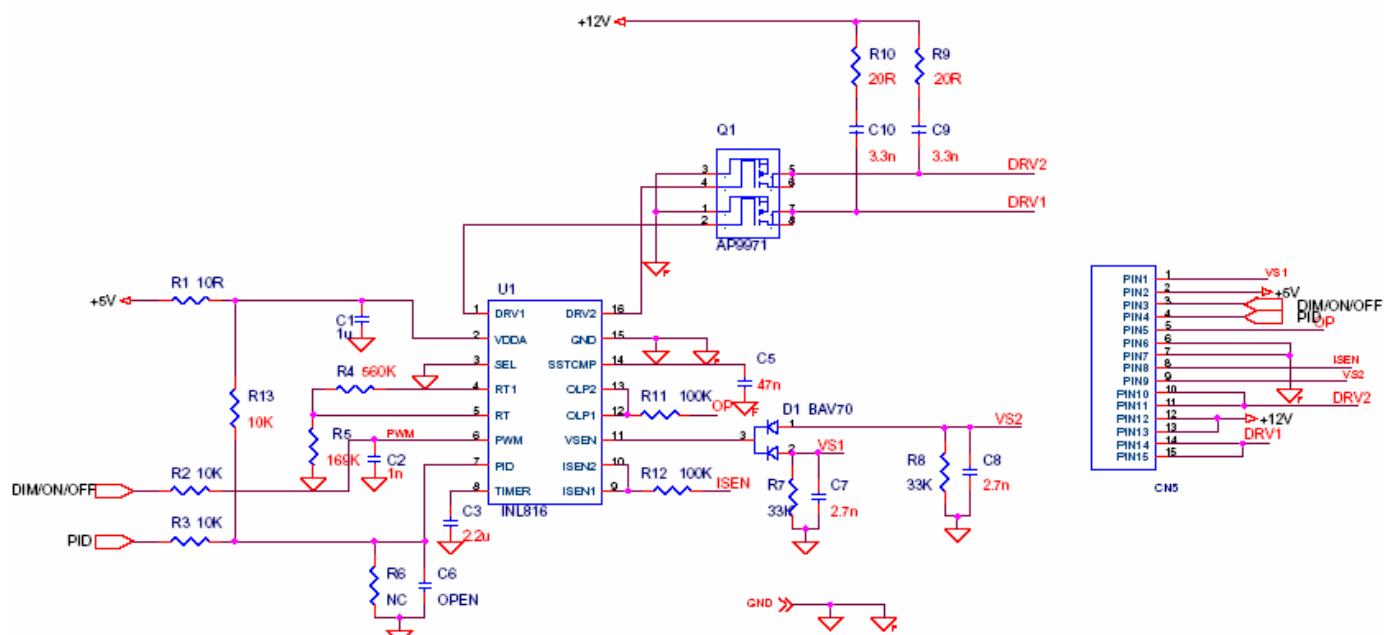


Fig.2

DC_5V through R1 and C1 will provide power for U1 on the pin2(VDDA),When the voltage at VDDA is less than ~3.4V,the IC will enter the lockout mode. The IC will resume operation when the voltage at pin VDDA exceeds an approximate 3.8V threshold.

Pin3(SEL) used to select appropriate drive topologies, connecting pin SEL to GED shows the IC in the

push-pull configuration..

SSTCMP(pin14) applies the soft-start function and the loop compensation function. C5 at SSTCMP compensates the feedback loop and provides good transient response to load changes.

When the IC is enabled, it starts from the striking mode and the TIMER(pin8) is activated. During lamp ignition, if the voltage at pin SSTCMP exceeds an approximate 2.0V threshold, the drive frequency will switch from striking frequency to the operation frequency. The striking frequency is determined by (R4 & R5) connected to Pin 4(RT1) and Pin 5(RT). The operating frequency is determined just by R4.

Applying a voltage level greater than 2V from IF BD to pin6(PWM) can enable the IC, Once the voltage less than ~1.0V for longer than 20ms will disable the IC.

Once the lamps are ignited and the voltage at pins ISEN1(pin9),ISEN2(pin10),OLP1(pin12),and OLP2(pin13) all exceed approximately 0.8V,the IC enters the normal operation mode and the PWM dimming control is activated. During start up, ISEN1 (pin9and pin10) senses the voltage on the transformer secondary. If no current is sensed approximately 2 seconds, U1 shuts off. re used to limit current. C3 is used to dump noise.

DRV1 and DRV2 of U1 are used to drive Q1. DRV1 and DRV2 are controlled by build-in PWM IC. Q1 is switched which has two build-in IGBTs. The working principle of circuit of T1, the same to circuit of Power.

The voltage signal on negative pole of D1 sensed through R7/R8 comes to Pin11 of U1 VSEN (Lamp Current Detection & Control). The CCFL current is detected through R12/R21 and reaches a regulated value. The CCFL current detected at resistor R12/R21 is converted to a voltage level and input to the ISEN1/2. Once the CCFLs are ignited and current is sensed through resistor R12/R21, performs the loop compensation function. The voltage at IC pin12 controls the drive duty cycle of the power MOSFETs to regulate the CCFL current.

2.1.2 Output Circuit and Protection Circuit operations:(fig.3)

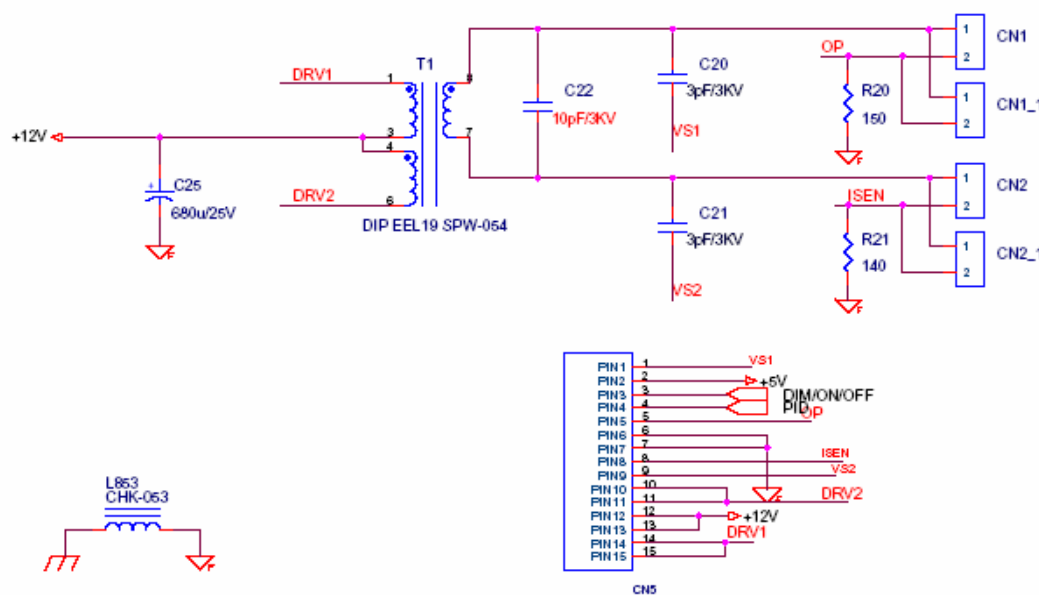


Fig.3

The transformer (T1) secondary winding leakage inductance and output capacitance(C22) forms a lower pass filter,which converts the square-wave driving signal into a sinusoidal output voltage signal for CCFL.

The over-voltage protection feature is implemented by using an external capacitor divider (C20/C21) to sense the output voltage. The divide-down voltage signal is sent to the IC Pin11 (VSEN), thus regulating the output voltage at the transformer secondary.

If a CCFL is removed, fails or damaged during normal operation, CCFL current is no longer sensed and the voltage on ISEN1/ISEN2 drops. Once the voltage at the ISEN1/ISEN2 pin is less than the lamp” on” threshold, the shutdown timer is activated. The IC maintains the output voltage for approximately 2-3seconds and once the timer reaches a threshold of approximately 3V, the IC will shutdown. To restart the IC, either toggle the SST_CMP pin or recycle the power on the VDDA pin.

2.2 Power PWM circuit operations

2.2.1) Block diagram:(fig.4)

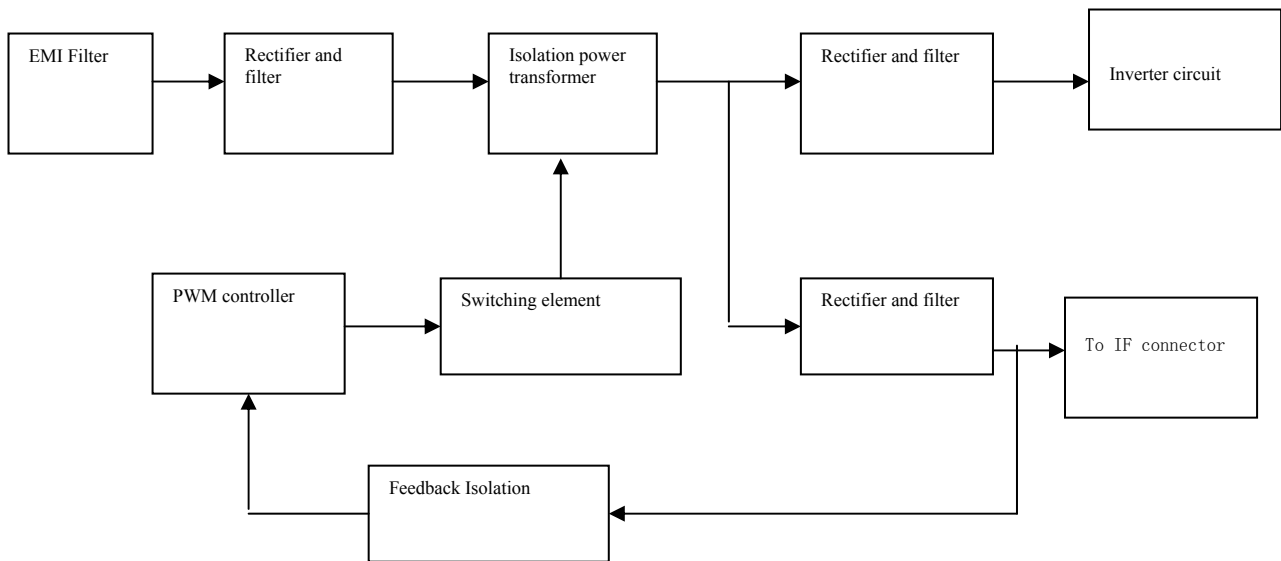


Fig.4

2.2.2) AC Input and EMI Filter:(fig.5)

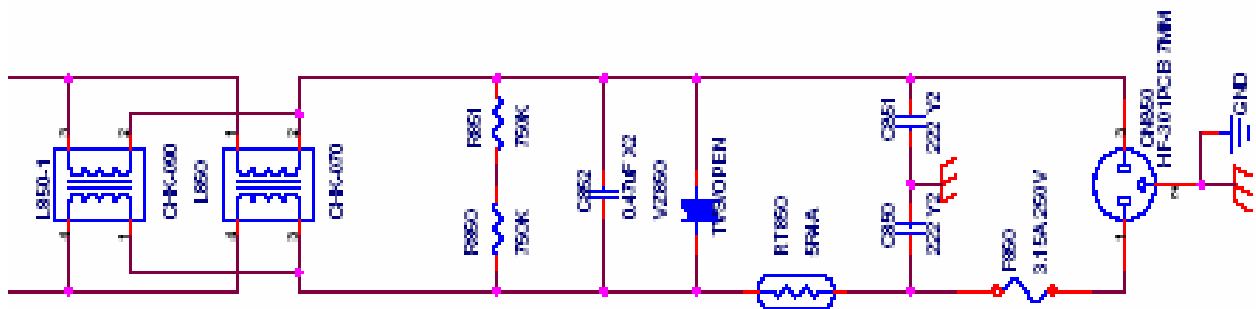


Fig.5

CN850 is a connector for connecting AC Power. F850 is a fuse to protect all the circuit AC. Input voltage is from 90V to 264V. R850 and R851 are joined between two inputting main circuit to prevent man from shock. L850 is used to filter low frequency noise. C850 and C851 are used to discharge the noise that L850 produced. High frequency waves are damped by C852 .

2.2.3)High Voltage to Low Voltage Control Circuit:(fig.6)

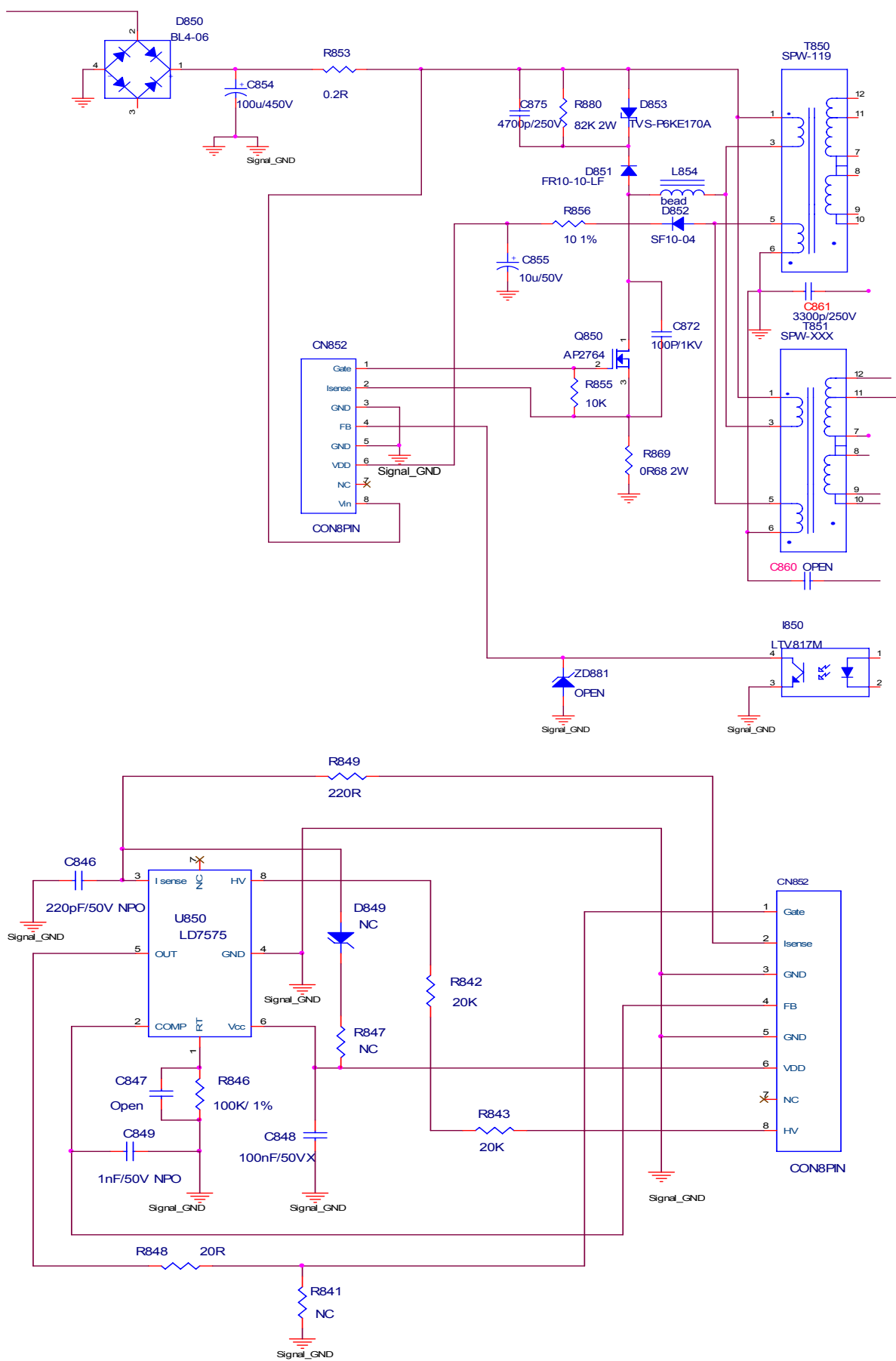


Fig.6

D850 is a rectifier in which there are 4 build-in diodes, inverting AC to DC.

C854 is used to smooth the wave from rectifier. R852 is a fuse resistor to protect the following circuit when inrush current is too large.

U850 is a current-mode PWM controller with excellent power-saving operation. It features a high-voltage current source to directly supply the startup current from bulk capacitor and further to provide lossless startup circuit. Max start-up current for U850 is 100 uA. When current flow from the bulk capacitor C854 through R843 and R842 gets to HV pin to start up U850. Meanwhile, the VCC supply current is as low as 100 uA thus most of the HV current is utilized to charge the VCC capacitor C855. Whenever the Vcc voltage is higher than UVLO (16V), the GATE pin will output signal to drive the power MOSFET(Q850), the high-voltage current source is off and the supply current is provided from the auxiliary winding of the transformer PIN5.

When U850 begins to operate Pin8 of U850 will output square wave to drive Q850, then the main current flow get to GND bypassing through T850, Q850. Because of the change of current flow, wires in the other side of T850 will induct current. In the same time, the current inducted by wires which connected T850 Pin 1 and Pin 3, with components of D852, R856 and C855, will be supplied to U850 for normal operating.

The typical current mode PWM controller feedbacks both current signal and voltage signal to close the control loop and achieve regulation. U850 detects the Q850 current from Isense pin which max voltage is set as 0.85V, then the Q850 current can be calculated as: $I_{peak} = 0.85V / R869$. When the sense voltage across the sense resistor R869, reaches the threshold voltage over 0.85V, the output GATE drive will be turned off. R849 and C846 is used to avoid the Isen pin damaged by the negative turn-on spike.

The voltage feedback signal is provided from the TL431(I851) through the I850 to the COMP pin. When the voltage on COMP pin is lower than 1.2V, the IC will turn off.

When Q850 is turned off, the main current flow will be consumed through D851, C875, R880, this will prevent Q850 from being damaged under large current impulse and voltage spike.

RT pin is to program the switching frequency, by connecting R846 to ground to set the switching frequency, $f = (65.0 / R846) * 100(KHz)$.

2.2.4) DC 12V and DC 5V Output Circuit and Feedback circuit:(fig.7)

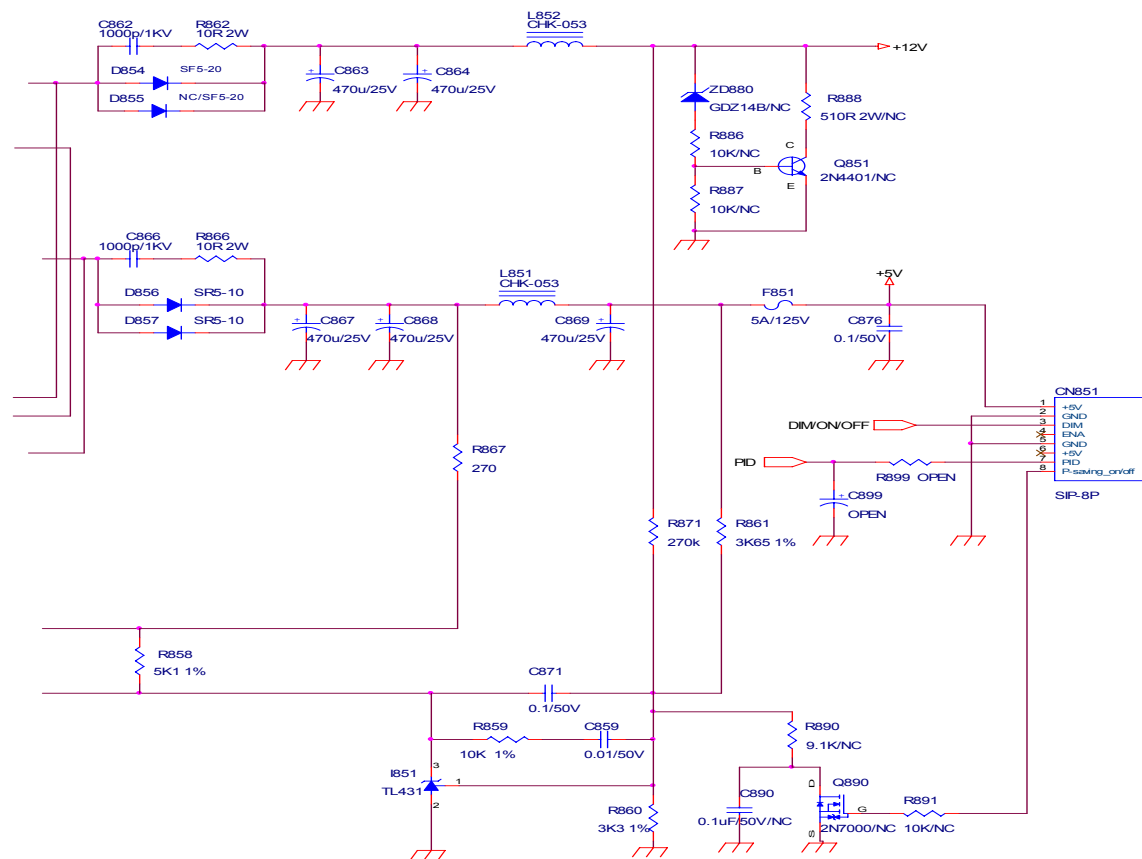


Fig.7

D854 is used to rectify the inducted current. R862 and C861 are used to store energy when current is reversed. The parts including C862, C865 and L852 are used to smooth the current waves that are from D855, then 13V voltage is supplied.

D856 and D857 are SCHTKY diodes used to rectify the inducted current. C866 and R866 are used to store energy when current is reversed. The components including C864, C874, C875, L851 and C876 are used to smooth the current waves, then DC+5V voltage is supplied. F851 is used for OCP for the LPS test.

DC 5V supply voltage feed back to PWM controller U850 via R861, R860, R859, C859, I851, R857, R863 used to control the voltage feedback loop.

2.3 I/F Board Circuit

2.3.1 RGB CAPTURE

- Signal RED, GREEN, BLUE input through CN301 #1, #2, #3, Stop DC via C303, C302 and C301, and then enter into U401 (gm2621-LF) analog input terminal #99, #96, #93, and then gm2621-LF deals with signal internally. D303, D302, D301 are ESD protector to prevent U401 from ESD.
- Signal DDC_SCL (series clock) inputs via CN301#15, and then passes through ZD305 for ESD protection, goes into EDID EEPROM IC U301 #6.
- Signal DDC_SDA (series data) inputs via CN301#12, and then passes through ZD306 for ESD protection, goes into EDID EEPROM IC U301 #5.
- Signal TTL vertical sync. (Vsync) inputs via CN301 #14, and then clamped by ZD302 Zener, passes through R311, and then goes into IC U401 (gm2621-LF) #90.
- Signal TTL horizontal sync. (Hsync) inputs via CN301 #13, and then clamped by ZD303 Zener, passes through R310, and then goes into IC U401 (gm2621-LF) #89.
- CN301#5 is defined as cable detect pin, this detector realize via R319 and U401#114, and ZD301 is ESD protector.
- U301 +3.3V is supplied by PC via CN301#9 or supplied by Monitor self via D307 with D306 and ZD304 for ESD protection.
- U301 is an EEPROM IC which is memory and EDID data saved in it.

2.3.2 Buttons Control

- Button “Power” on front bezel connects to U401 (gm2621-LF) #125 through CN401 #8, U401 #125 is defined as power on/off.
- Button “+” on front bezel connects to U401 (gm2621-LF) #124 through CN401 #3, U401 #124 is defined as “Plus”.
- Button “-” on front bezel connects to U401 (gm2621-LF) #123 through CN401 #2, U401 #123 is defined as “Minus”.
- Button “Menu” on front bezel connects to U401 (gm2621-LF) #122 through CN401 #1, U401 #122 is defined as “Menu”.
- LED Indicator on Front Bezel
 - a. When press button “power”, U401(Scalar) #125 be send in low potential, make U401#57 sends out high potential, and then to J1#2 on keypad, LED Green on.
 - b. When in “Suspend” mode, U401 (Scalar) #56 sends out a high potential, and then to J1 #3 on keypad, LED Amber ON.

2.3.3 ST CHIP U401 (gm2621-LF)

- U401 (gm2621-LF) #7~#10 output 8 bit even and #31~#40 output 8 bit odd LVDS digital data to panel control circuit through CN501.
- U401 (gm2621-LF) #127 output PPWR ”H” potential to make Q502 conducted, and then make Q501 conducted, +5V flow to CN501#1~#3 as Panel Vdd .
- U401 (gm2621-LF) #49 output CCFL_ON/OFF ”H” potential to control Inverter on/off.
- U401 (gm2621-LF) #50 outputs Brightness “PWM” signals to control CCFL brightness.
- TCLK by Crystal 14.318MHz input to U401 (gm2621-LF) #109.
- U401 (gm2621-LF) #111 Bidirectional RESET signals

Please refer to gm2621-LF Pin Assignments table in page

2.3.4 Regulator Circuit

- +5V is from switching mode power supply for panel and Regulator U601
- +3.3V generates from Regulator U601 supply for U401, U301, U402 used.
- +1.8V generates from Regulator U602 through C603, C604 filtering which is output +1.8V for U401 used.

3. FACTORY PRESET TIMING TABLE

Standard	Resolution	Horizontal Frequency (KHz)	Vertical Frequency (Hz)
VESA	640 x 480	31.469	59.940
	640 x 480	37.500	75.000
	800 x 600	37.879	60.317
	800 x 600	46.875	75.000
	1024 x 768	48.363	60.004
	1024 x 768	60.023	75.029
	1152x864	67.500	75.000
	1280x1024	48.483	60.042
	1280x1024	60.087	75.034
IBM DOS	720 x 400	31.469	70.087

4. Power On/Off Sequency

Hardware Power ON

When power cord plug into AC socket, Power provides 12V,&DC_5V from through U850, DC_3.3V be generated from DC_3.3V Regulator U601.DC_5V is voltage for panel, DC_3.3v is main voltage for U401. When DC_3.3V input to U401, U401 reset circuit active, set U401 all registers to default,. That means finish hardware power on.

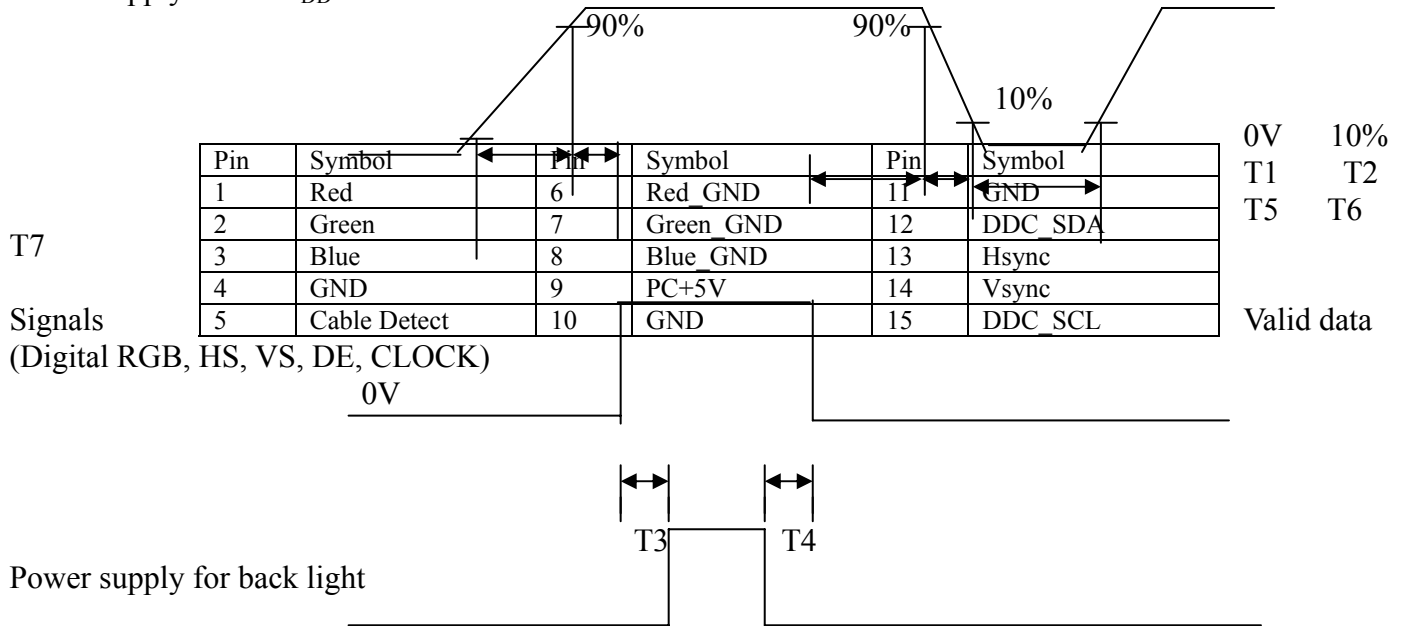
Software Power ON/OFF

When press power key, U401 #125 recieves low pulse, and then (gm2621-LF) U401 will be wake up and send high plus(at 127,49pin) to on CCFL and switch 5.0v to panel module. And make the VGA cable input signal source display normal on panel.

- If Power ON, U402 #57 (LED_Green) will send out High potential, and then LED green on.
- If Power OFF, U402 #56 (LED_Amber) will send out High potential, and then LED Amber on.

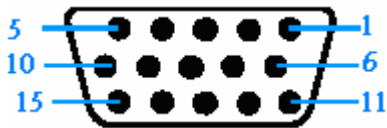
The Panel_Vcc, Backlight_En, CLK/DATA output to panel will follow the following sequency.

Power supply for V_{DD}

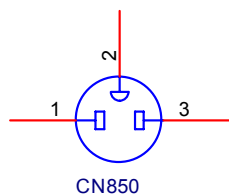


	T1(ms)	T2 (ms)	T3 (ms)	T4 (ms)	T5 (ms)	T6 (ms)	T7(ms)
SPEC (LGD)	0.5~10	0.001~50	>200	>200	0.001~50		>500
SPEC (HSD)	0.5~10	0~50	>200	>200	0.0~50		>500

5. D-SUB Connector Pin Assignment



6. AC Outlet Pin Assignment



Pin	Symbol	Description
1	Line	
2	GND	
3	Neutral	

7. Inner Connector Pin Assignment

7.1 CN501 (Connect M/B to Panel, C11330MGHR0 or compatible connector)

Pin	Symbol	Description
1	Panel_Vcc	Panel power supply (typ.5.0V)
2	Panel_Vcc	Panel power supply (typ. 5.0V)
3	Panel_Vcc	Panel power supply (typ. 5.0V)
4	NC	
5	NC	
6	NC	
7	GND_LVDS	LVDS Ground
8	RXE3+	LVDS signal of even channel 3(-)
9	RXE3-	LVDS signal of even channel 3(+)
10	RXEC+	LVDS signal of even channel clock (+)
11	RXEC-	LVDS signal of even channel clock (-)
12	RXE2+	LVDS signal of even channel 2(+)
13	RXE2-	LVDS signal of even channel 2(-)
14	GND_LVDS	LVDS Ground
15	RXE1+	LVDS signal of even channel 1(+)
16	RXE1-	LVDS signal of even channel 1(-)
17	GND_LVDS	LVDS Ground
18	RXE0+	LVDS signal of odd channel 0(+)
19	RXE0-	LVDS signal of odd channel 0(-)
20	RXO3+	LVDS signal of odd channel 3(+)
21	RXO3-	LVDS signal of odd channel 3(-)
22	RXOC+	LVDS signal of even channel clock (+)
23	RXOC-	LVDS signal of even channel clock (-)
24	GND_LVDS	LVDS Ground
25	RXO2+	LVDS signal of even channel 2(+)
26	RXO2-	LVDS signal of even channel 2(-)
27	RXO1+	LVDS signal of even channel 1(+)
28	RXO1-	LVDS signal of even channel 1(-)
29	RXO0+	LVDS signal of odd channel 0(+)
30	RXO0-	LVDS signal of odd channel 0(-)

7.2 CN1, CN2 (Connect to Panel Backlight, SM02B-BHSS-1-TB or compatible connector)

Pin	Symbol	Description
1	HV	High voltage for lamp
2	LV	Low voltage for lamp

7.3 CN401 (Connect to keypad, SZ7103016B or compatible connector)

Pin	Symbol	Description
1	MENU	OSD "MENU" control
2	DOWN	OSD "-" control
3	UP	OSD "+" control and auto adjustment control
4	GND	Ground
5	GND	Ground
6	LED_Green	LED Green on/off control
7	LED_Amber	LED amber on/off control
8	Power	Power on/off control

8. Key Parts Pin Assignments

8.1 U401 (gm2621-LF) I/O Legend: P=Power, G=Ground, O=Output, I=Input, A=Analog

Pin	Symbol	I/O	Description
1	AVSS_BIAS	G	Analog ground for LVDS PLL and Bandgap
2	VDD_OUT_33	P	Digital 3.3V supply for LVDS output
3	RESERVED	O	Reserved; Do not connect
4	RESERVED	O	Reserved; Do not connect
5	RESERVED	O	Reserved; Do not connect
6	RESERVED	O	Reserved; Do not connect
7	E_CH3P_LV	O	LVDS signal of even channel 3(+)
8	E_CH3N_LV	O	LVDS signal of even channel 3(-)
9	E_CLKP_LV	O	LVDS signal of even channel clock (+)
10	E_CLKN_LV	O	LVDS signal of even channel clock (-)
11	E_CH2P_LV	O	LVDS signal of even channel 2(+)
12	E_CH2N_LV	O	LVDS signal of even channel 2(-)
13	E_CH1P_LV	O	LVDS signal of even channel 1(+)
14	E_CH1N_LV	O	LVDS signal of even channel 1(-)
15	E_CH0P_LV	O	LVDS signal of even channel 0(+)
16	E_CH0N_LV	O	LVDS signal of even channel 0(-)
17	CVDD_18	P	Core VDD connect to digital 1.8V
18	CRVSS	O	Chip digital ground
19	RESERVED	O	Reserved; Do not connect
20	RESERVED	O	Reserved; Do not connect
21	RESERVED	O	Reserved; Do not connect
22	RESERVED	O	Reserved; Do not connect
23	RESERVED	O	Reserved; Do not connect
24	RESERVED	O	Reserved; Do not connect
25	Vdd_out_33	P	Digital 3.3V supply for LVDS output
26	VSS_OUT	G	Digital ground for LVDS output
27	RESERVED	O	Reserved; Do not connect
28	RESERVED	O	Reserved; Do not connect
29	RESERVED	O	Reserved; Do not connect
30	RESERVED	O	Reserved; Do not connect
31	O_CH3P_LV	O	LVDS odd channel 3 positive. Reserved for gm5611 and gm2621
32	O_CH3N_LV	O	LVDS odd channel 3 negative. Reserved for gm5611 and gm2621
33	O_CLKP_LV	O	LVDS odd channel clock positive. Reserved for gm5611 and gm2621
34	O_CLKN_LV	O	LVDS odd channel clock negative. Reserved for gm5611 and gm2621
35	O_CH2P_LV	O	LVDS odd channel 2 positive. Reserved for gm5611 and gm2621
36	O_CH2N_LV	O	LVDS odd channel 2 negative. Reserved for gm5611 and gm2621
37	O_CH1P_LV	O	LVDS odd channel 1 positive. Reserved for gm5611 and gm2621
38	O_CH1N_LV	O	LVDS odd channel 1 negative. Reserved for gm5611 and gm2621
39	O_CH0P_LV	O	LVDS odd channel 0 positive. Reserved for gm5611 and gm2621
40	O_CH0N_LV	O	LVDS odd channel 0 negative. Reserved for gm5611 and gm2621
41	RESERVED	O	Reserved; Do not connect
42	RESERVED	O	Reserved; Do not connect
43	RESERVED	O	Reserved; Do not connect

44	RESERVED	O	Reserved; Do not connect
45	RESERVED	O	Reserved; Do not connect
46	RESERVED	O	Reserved; Do not connect
47	VDD_OUT_33	P	Digital 3.3V supply for LVDS output
48	VSS_OUT	G	Digital ground for LVDS output
49	PBIAS	O	Panel backlight enable
50	PWM0/GPO_4	I/O	PWM0 output or optional general-purpose output GPO_4. Also used for bootstrap control
51	GPIO_0	I/O	General-purpose output GPO_0. Also used for bootstrap control
52	CRVSS	G	Chip digital ground
53	RVDD_33V	P	Digital Output VDD. Connect to digital 3.3V
54	CRVSS	G	Chip digital ground
55	CVDD_18	P	Core VDD connect to digital 1.8V
56	GPIO_1	I/O	General-purpose output GPO_1. Also used for bootstrap control
57	GPIO_2	I/O	General-purpose output GPO_2. Also used for bootstrap control
58	GPIO_3	I/O	General-purpose output GPO_3. Also used for bootstrap control
59	SPI_CS _n	I/O	SPI ROM chip select. Also used for bootstrap control.
60	SPI_CLK	I/O	SPI ROM Clock output.
61	SPI_DI	I/O	SPI ROM Data input. Connect this pin to the data output of Serial FLASH
62	SPI_DO	I/O	SPI ROM Data input. Connect this pin to the data input of Serial FLASH
63	RVDD_33V	P	Chip digital ground
64	DDC_SCL_VGA	I	DDC2Bi clock for Analog Port
65	DDC_SDA_VGA	I/O	DDC2Bi clock for Analog Port, internal pull up of 10K ohms
66	DDC_SCL_DVI/ HOST_SCA	I	DDC2Bi clock for DVI Port or host I2C clock signal for debugging
67	DDC_SDL_DVI/ HOST_SDA	I/O	DDC2Bi clock for DVI Port or host I2C data signal for debugging, internal pull up of 10k ohms
68	AVSS_DVI	G	Analog GND for DVI input. Reserved for gm2621 and gm2621; Do not connect
69	REXT	I	External reference resistor. A 1%, 250Ω resistor should be connected from this pin to pin 74. Reserved for gm2621 and gm2621; Do not connect.
70	AVDD_DVI_18	P	Analog VDD (1.8V) for DVI input. Must be bypassed with external capacitor(s) to AVSS_DVI. Reserved for gm2621 and gm2621; Do not connect.
71	AVSS_DVI	G	Analog GND for DVI input. Reserved for gm2621 and gm2621; Do not connect.
72	RX2+	I	Do not connect.
73	RX2-	I	Do not connect.
74	AVDD_DVI_33	P	Analog VDD (3.3V) for DVI input. Reserved for gm2621 and gm2621; Do not connect.
75	RX1+	I	Do not connect.
76	RX1-	I	Do not connect.
77	AVSS_DVI	G	Analog GND for DVI input. Reserved for gm2621 and gm2621; Do not connect.
78	AVDD_DVI_18	P	Analog VDD (1.8V) for DVI input. Must be bypassed with external capacitor(s) to AVSS_DVI. Reserved for gm2621 and gm2621; Do not connect.
79	AVSS_DVI	G	Analog GND for DVI input. Reserved for gm2621 and gm2621; Do not connect.
80	RX0+	I	Do not connect.

81	RX0-	I	Do not connect.
82	AVDD_DVI_33	P	Analog VDD (3.3V) for DVI input. Reserved for gm2621 and gm2621; Do not connect.
83	RXC+	I	Do not connect.
84	RXC-	I	Do not connect.
85	AVSS_DVI	G	Analog GND for DVI input. Reserved for gm2621 and gm2621; Do not connect.
86	AVDD_DVI_18	P	Analog VDD (1.8V) for DVI input. Must be bypassed with external capacitor(s) to AVSS_DVI. Reserved for gm2621 and gm2621; Do not connect.
87	CVDD_18	P	Core VDD connect to digital 1.8V
88	CRVSS	G	Chip digital ground
89	HSYNC	I	ADC input horizontal sync or composite sync input.
90	VSYSN	I	ADC input vertical sync
91	RVDD_33V	P	Digital Output VDD. Connect to digital 3.3V
92	AVDD_ADC_33	I	1.8V for gmZAN3SL core
93	BLUE+	I	Positive analog input for Blue channel
94	BLUE-	I	Negative analog input for Blue channel
95	AVSS_ADC	G	Analog ground for ADC
96	GREEN+	I	Positive analog input for Green channel
97	GREEN-	I	Negative analog input for Green channel
98	AVSS_ADC	G	Analog ground for ADC
99	RED+	I	Positive analog input for Red channel
100	RED-	I	Negative analog input for Red channel
101	AVDD_ADC_33	P	Analog power (3.3V) for ADC. Must be bypassed with capacitor to AVSS_ADC pin.
102	AVSS_ADC	G	Analog ground for ADC
103	AVSS_ADC	G	Analog ground for ADC
104	AVDD_ADC_18	P	Analog power (1.8V) for ADC. Must be bypassed with capacitor to AVSS_ADC pin.
105	VBUFC_RPLL	O	Reserved; Do not connect
106	VDD_RPLL_18	P	Digital 1.8V Power for PLL
107	VSS_RPLL	G	Ground for PLL
108	XTAL	O	Connect to 14.3MHz crystal. Should be bypassed with capacitor to AVDD_RPLL_33.
109	TCLK	I	Connect to 14.3MHz crystal. Should be bypassed with capacitor to AVDD_RPLL_33.
110	AVDD_RPLL_33	P	Analog power (3.3V) for PLL
111	RESETn	I/O	Bypass with 0.01uF capacitor GND
112	LBADC_VSS	G	Ground for general-purpose LBADC
113	LBADC_IN3	I	Ground-purpose LBADC input 3.
114	LBADC_IN2	I	Ground-purpose LBADC input 2.
115	LBADC_IN1	I	Ground-purpose LBADC input 1.
116	LBADC_VDD_33	P	3.3V supply for general-purpose LBADC.
117	CRVSS	G	Chip digital ground
118	CVDD_18	P	Core VDD connect to digital 1.8V
119	PWM0/GPO_5	I/O	PWM0 output or optional general-purpose output GPO_5. Also used for bootstrap control
120	GPIO_8	I/O	General-purpose input/output 8
121	GPIO_9	I/O	General-purpose input/output 9
122	GPIO_10	I/O	General-purpose input/output 10
123	GPIO_11	I/O	General-purpose input/output 11
124	GPIO_12	I/O	General-purpose input/output 12

125	GPIO_13	I/O	General-purpose input/output 13
126	GPIO_14	I/O	General-purpose input/output 14
127	PPWR	O	Panel power enable
128	AVDD_BIAS_33	P	Analog 3.3V supply for LVDS PLL and Bandgap

8.2 U402 (Serial Flash)

Pin	Symbol	I/O	Description
1	CE#	I	The device is enabled by a high to low transition on CE#. CE# must remain low for the duration of any command sequence.
2	SO	I/O	To transfer commands, addresses, or data serially into the device.
3	WP#	I/O	The write protect (WP#) pin is used to enable/disable BPL bit in the status register.
4	VSS	G	Connect ground
5	SI	I/O	To transfer commands, addresses, or data serially into the device input are latched on the rising edge of the serial clock.
6	SCK	I/O	To provide the timing of serial interface. Commands, addresses, or input data are latched on the rising edge of the clock input, while output data is shifted out on the Falling edge of the clock input.
7	HOLD	I/O	To temporarily stop serial communication with SPI flash memory without resetting the device.
8	VDD	P	To provide power supply.

8.3 U850 (LD7575, Power Controller)

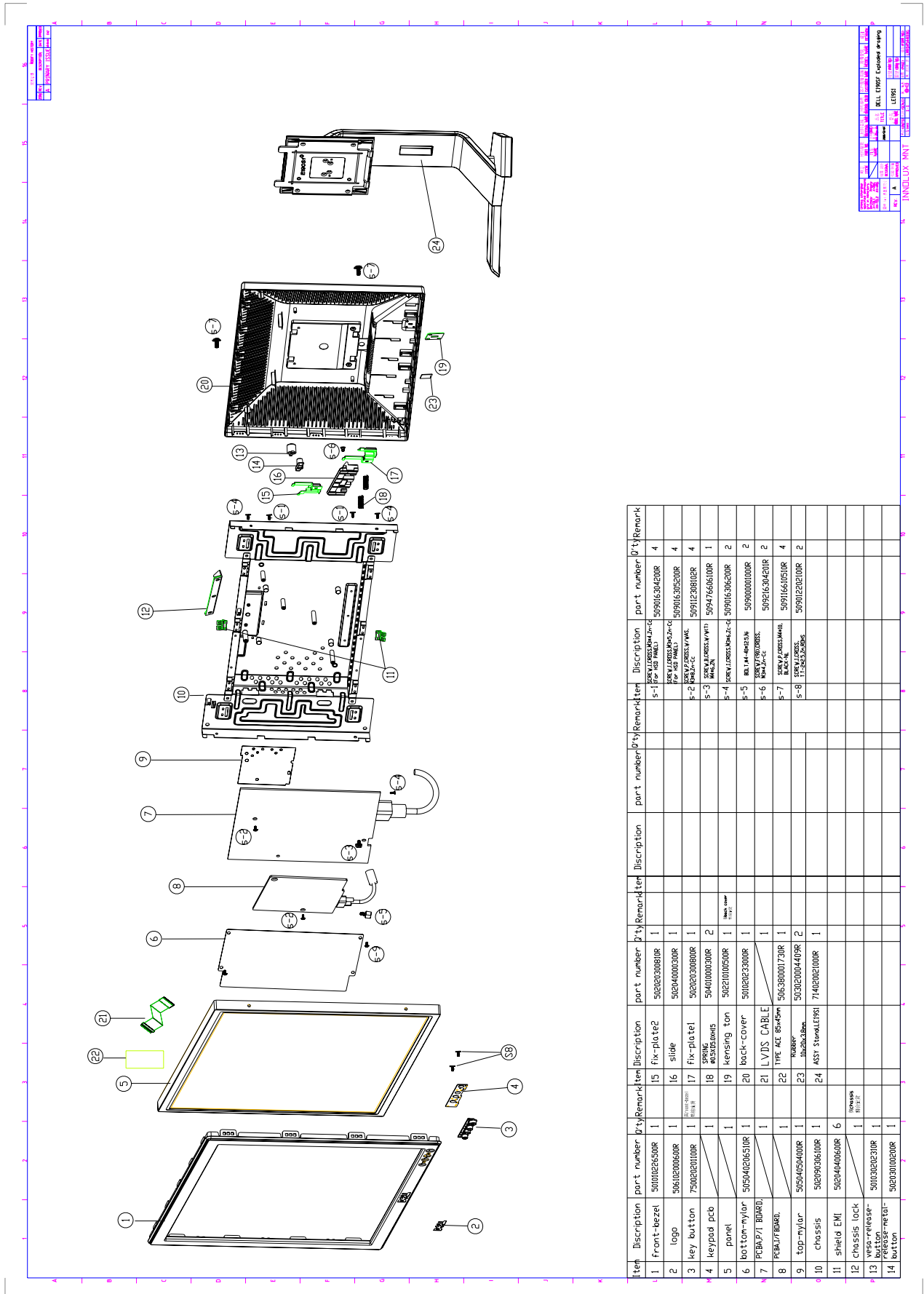
Pin	Symbol	I/O	Description
1	RT		This pin is to program the switching frequency
2	COMP	I	Voltage feedback pin, By connecting a photo-coupler to close the control loop and achieve the regulation
3	CS	I	Current sense pin
4	GND		
5	OUT	O	PWM output, Gate drive output to drive the external MOSFET
6	VCC	I	Power supply
7	NC		Unconnected pin
8	HV	I	PWM output

8.4 U1 (INL816GN, CCFL Inverter controller IC)

Pin	Symbol	I/O	Description
1	DRV1	O	Driver output 1
2	VDDA	---	Supply voltage input
3	SEL	I	Select Signal for Push-Pull or Half-Bridge Topology
4	RT1	I/O	Timing Resistor for Striking Frequency
5	RT	I/O	Timing Resistor for Operation Frequency
6	ENAPWM	I	Enable and PWM Dimming input
7	PID	I	Analog Dimming input
8	TIMER	I/O	Timing Capacitor for Delay Timer
9	ISEN1	I	Current feedback 1
10	ISEN2	I	Current feedback 2
11	VSEN	I	Voltage Feedback
12	OLP1	I	Open-Lamp Protection Sense 1
13	OLP2	I	Open-Lamp Protection Sense 2
14	SSTCMP	I/O	Soft-Start and Compensation
15	GNDA	---	Ground
16	DRV2	O	Driver output 2

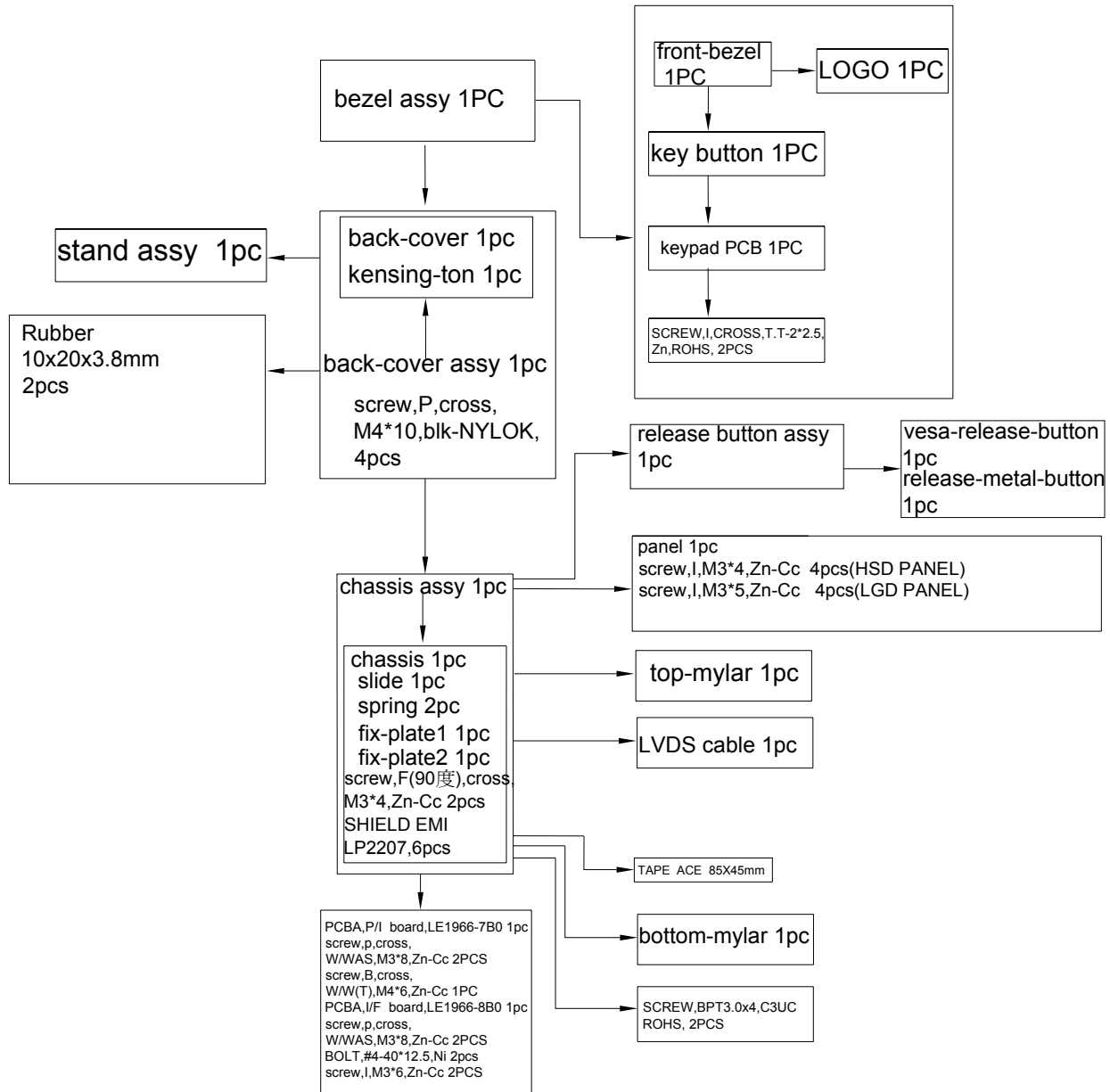
Chapter 4- Disassembly & Assembly

1. Exploded Diagram



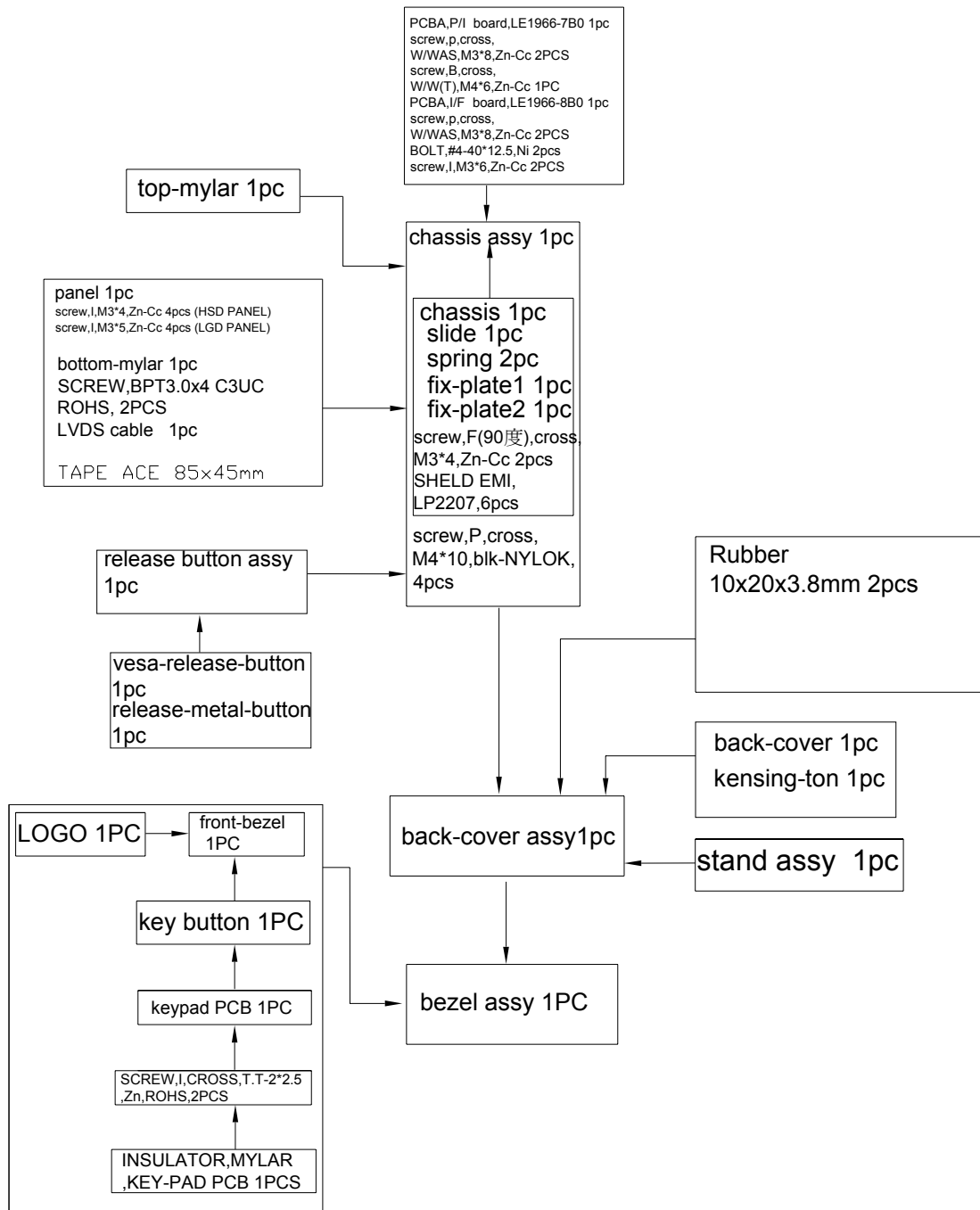
2. E198FPf Disassembly Block

DELL E190Sf DISASSEMBLY BLOCK



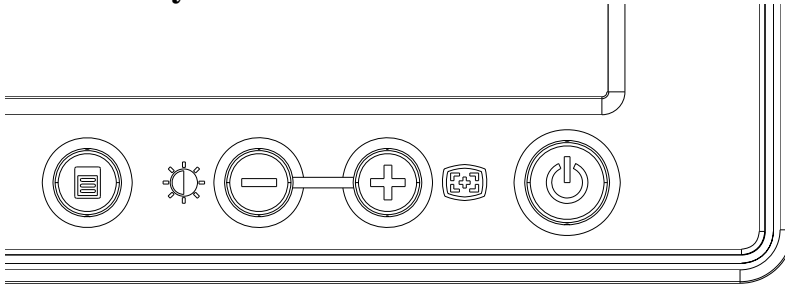
3. Assembly Block

DELL E190Sf ASSEMBLY BLOCK



Chapter 5- TEST AND ADJUSTMENT

1. Function key Definitions



Power Switch	<i>Power:</i> On/Off, includes power indicator and Power ICON
Power LED	Green- Active On Amber- DPMS
Front Panel Controls	<i>Adjust Up:</i> (+)symbol molded into button, move up the highlight bar <i>Adjust Down:</i> (-) symbol molded into button, calls out brightness/Contrast, move down the highlight bar. <i>Menu:</i> Call out OSD Menu and select the item
Hot Key Function	<i>Automatic adjust:</i> Directly press “+” <i>Brightness/Contrast Icon:</i> Directly press “-“

2. OSD Control

First	Second	Third	Fourth
Brightness/Contrast (Press “-” directly)		Exit	
		Contrast	
		Brightness	
	Positioning	Exit	
		Horizontal	
		Vertical	
	Image setting	Exit	
		Auto Adjust	
		Pixel Clock	
		Phase	
	Color Setting	Normal Preset	
		Blue Preset	
		Red Preset	
		User Preset	Exit, R, G, B
	OSD Settings	Exit	
		Horizontal Pos.	
		Vertical Pos.	
		OSD Hold Time	
		OSD Lock	Yes, No
	Language	Exit	
		English	
		Espanol	
		François	
		Deutsch	
		Portuguese	
		Russia	
		Simplified Chinese	
		Japanese	
	Factory Reset	Exit	
		Position Settings Only	

		Color Settings Only		
		All Settings		
		Enable LCD Conditioning		
		DDC/CI	Enable	Disable
Automatic Adjustment (press “+“ directly)				

3. Factory Mode Introduction



Fig.1



Fig.2

With signal input, press “Power” button to turn off the monitor. Press “Menu” and “Auto/Plus” buttons together, and then press “Power” button to turn on the monitor. After power on, press “Menu” button to call out **Main Menu** (Fig.1). Pull down to **Factory Reset** and choose **Factory** to enter **Factory mode** (Fig.2).

Panel: JT094: Current using panel part number(DELL supply)

Exit: Exit from **Factory mode** and back to **Reset to Factory Settings**.

Auto Color: Automatically calibrate chip ADC parameters by using internal DAC. (Only with Burn-in ON)

Burn In: Enable or disable the Burn-in mode by choosing ON or OFF.

Reset Timer: Reset the “Turn-on time” of the panel to 0H0M.

Color Temp: The R, G, B of Blue Preset (9300K), Red Preset (5700K) and Normal Preset (6500K) are generated from scaling chip’s back-end white-balance program.

Time: Turn-on time of the panel.

4. Burn-in pattern

If it is a new monitor without VGA cable plugged in, burn-in pattern will self-generate automatically. Burn-in pattern will not be stopped until plugging in the VGA cable. Then, press “Menu” button to call out **OSD Main Menu**; pulling down to **Factory Reset** item and execute **All Resetting** to disable Bun-in ON.

5. Auto Color Balance (Automatically calibrate chip ADC parameter by using chip internal DAC.)

5.1 If it is a new-built set, press “Auto/Plus” button to execute “Auto Color” at 32gray scale pattern.

5.2 Please confirm the following steps to perform “Auto Color Balance”:

- Connect the VGA cable with the standard video pattern generator and display 32gray scale pattern on the monitor.
- Press “Power” button to power off the monitor.
- Press “Menu” and “Auto/Plus” buttons simultaneously; then press “Power” button to power on the monitor.
- Press “Menu” button, pull down to **Factory Reset** and choose “Factory” item.
- Set **Burn In** to ON, then execute **Auto Color**.
- With “Auto Color” finished, return to **Reset to Factory Settings** OSD and execute **All Settings** to enable burn-in OFF.

6. EDID (Rewrite EDID data to EEPROM by Fox_VEDID_Programmer)

The Write-Protect Pin of EEPROM is generally pulled up to enable EDID to be read only; EDID cannot be written at that status. The following steps enable EDID to be written:

6.1 Connect the monitor and PC via a VGA cable.

6.2 Execute Fox_VEDID_Programmer.

- Click “browse” icon to choose a binary file from the PC.
- Type the “Serial Number” in the dedicated field. Each monitor will have its own serial number. Then click Enter on the keyboard to jump to next field.
- Type 1 to 2 characters or digits in “Travel Card SN” field. Then click Enter to start writing EDID to monitor.
- “PASS” will be shown with EDID finished programmed. Please plug out the AC power cord of the monitor to restart.

7. Upgrade Firmware to Serial via Flash Cable by Fox_VISP_Programmer

7.1 Connect the monitor and PC via a VGA cable.




7.2 Fox_VISP_Programmer enables users to upgrade the firmware of the monitor directly through the VGA cable of a PC. Please follow the steps for reprogramming the firmware:

- Click “Select Bin” icon to choose a binary file from the PC. The path of the selected binary file will be shown in the “Message” text window. Meanwhile, the checksum of the binary file will be calculated and displayed.
- Click “Connect” to check if the connection is satisfactory between the monitor and PC.
- If the connection is ready, click “Auto Programming F2 key” to begin flashing the firmware. During the flashing process, the motherboard of the PC will send out tick sound. If the firmware is reprogrammed successfully, “Command: Fast flash write successful” will be shown in the “Message” text window. The “successful update” condition will make the motherboard bring “Do-Re-Mi” sound five times with the interval of 500ms.

7.3 With the process of reprogramming firmware finished, plug out the power cable to restart the monitor.

※ The detailed reprogramming procedures will be described in Fox_VISP_Programmer User Manual.

- 8. After repair, to ensure the quality you should do the following test and adjustment.**

Item	Content	Equipment												
Test OSD function	1.Signal is set as 1280×1024@60Hz under General-1 2. LCM button are from left to right, checking whether each single function key and compound function key can be worked.	Chroma Signal Generator												
Contrast Check	1. Set input mode to 1280×1024@60Hz 2. Set to 32gray scale pattern 3. Set contrast to the maximum. At most 6 bars cannot be distinguished.	Chroma Signal Generator												
Color Temperature	1. Do “Auto color Balance” at 1280×1024@60Hz, 32gray scale pattern 2. Measure color temperature, check if it complies with the following temperature : 5700K x=0.328 +/- 0.03, y=0.344+/-0.03 6500K x= 0.313 +/- 0.03, y=0.329+/-0.03 9300K x= 0.283 +/- 0.03, y=0.298+/-0.03	Chroma Signal Generator and color analyzer												
Modes switching check	1. Use Chroma Pattern Generator to make sequence. VESA (640x480 800x600 1024x768 1152x864 1280x1024), the detail supported modes (see table 1) and power saving signal. 2. Confirm the above timing modes must be full screen and the picture must be normal. 3. LED is amber at power saving mode.	Chroma Signal Generator												
VGA cable detector	When VGA cable is not plugged out, self-test OSD will be floated.	Visual check												
Minimum luminance measurement	1. LCD minimum luminance spec is 200cd/m2 (0-15 months from mfg. date) 2. 0-15 months: > 80% of minimum luminance	Chroma Signal Generator and Color Analyzer												
OSD Lock Test 	Soft Lock: When OSD is locked, this icon should appear for only 2 seconds with all buttons pressed, except for the “Menu” and “Power” ones. Hard Lock: Press “Menu” button for 15 seconds enables the “locked” icon to be displayed, which will lock All buttons expect for the “Power”. Press “Menu” button for another 15 seconds enables the “unlock” icon to be shown.	Visual Inspection												
Panel Flicker check	1. Mode:1280×1024@60Hz 2. Set Brightness& Contrast to default value (75%) 3. Do “Auto Adjustment” 4. Shut down PC to check whether there’s flicker on the center of the picture.	Equipment:: Chroma Signal Generator & PC												
Power saving	1. Mode:1280×1024@60Hz 2. Pattern: full white 3. Brightness: Max. 4. Contrast: Default 5. Check power consumption at each modes <table border="1"> <thead> <tr> <th>State</th><th>Power Consumption</th><th>LED color</th></tr> </thead> <tbody> <tr> <td>Normal</td><td>< 25W</td><td>green</td></tr> <tr> <td>Stand By</td><td>< 1W</td><td>amber</td></tr> <tr> <td>Power Key Off</td><td>< 0.5W</td><td>no</td></tr> </tbody> </table>	State	Power Consumption	LED color	Normal	< 25W	green	Stand By	< 1W	amber	Power Key Off	< 0.5W	no	Chroma signal generator and Power meter AC input:230V/50Hz
State	Power Consumption	LED color												
Normal	< 25W	green												
Stand By	< 1W	amber												
Power Key Off	< 0.5W	no												

Chapter 6- TROUBLE SHOOTING

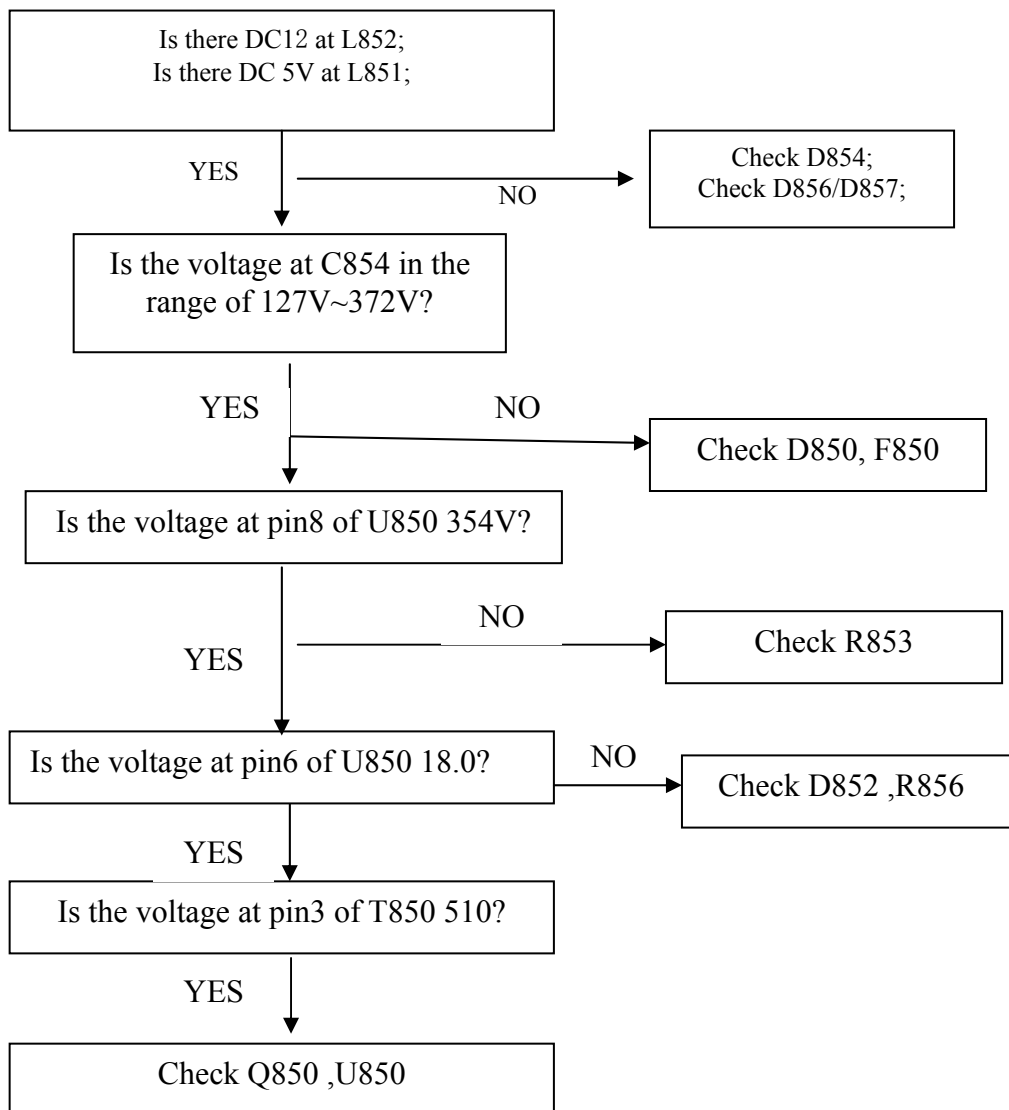
1. Common Acknowledge

- If you change the M/B, be sure that the U301 and U402 these two components also changed to the

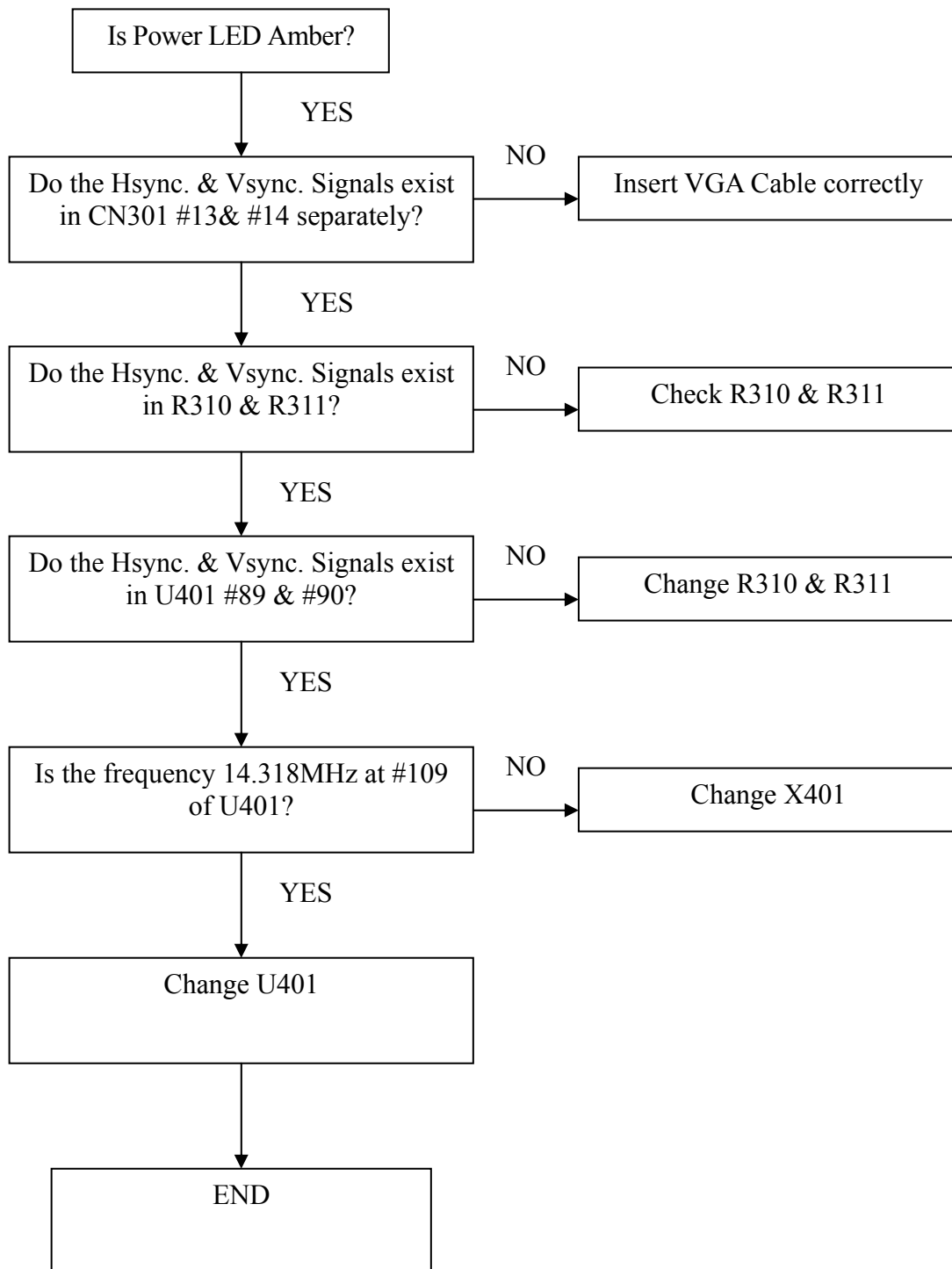
new M/B because there was program inside. If not, please re-write EDID or upload firmware into serial flash(U402) via VGA Cable. How to do please refer to the Page 19.

- If you adjust clock and phase, please do it at condition of Windows shut down pattern.
- Please confirm the R/G/B color under 32gray scale pattern.
- This LCM is analog interface. So if the entire screen is an abnormal color that means the problem happen in the analog circuit part, if only some scale appears abnormal color that stand the problem happen in the digital circuit part.
- If you check the H/V position, please use the crosshatch pattern.
- This LCM support 10 timing modes, if the input timing mode is out of specification, “Cannot Display this Video Mode” will be displayed on the screen.
- If brightness uneven, repairs Inverter circuit or change a new panel.
- If you find the vertical line or horizontal line lost on the screen, please change panel.
- If the self-test pattern is moving on the screen, please check whether VGA Cable is plugged in the Monitor or PC. If the VGA Cable is plugged in well, please change another VGA cable.

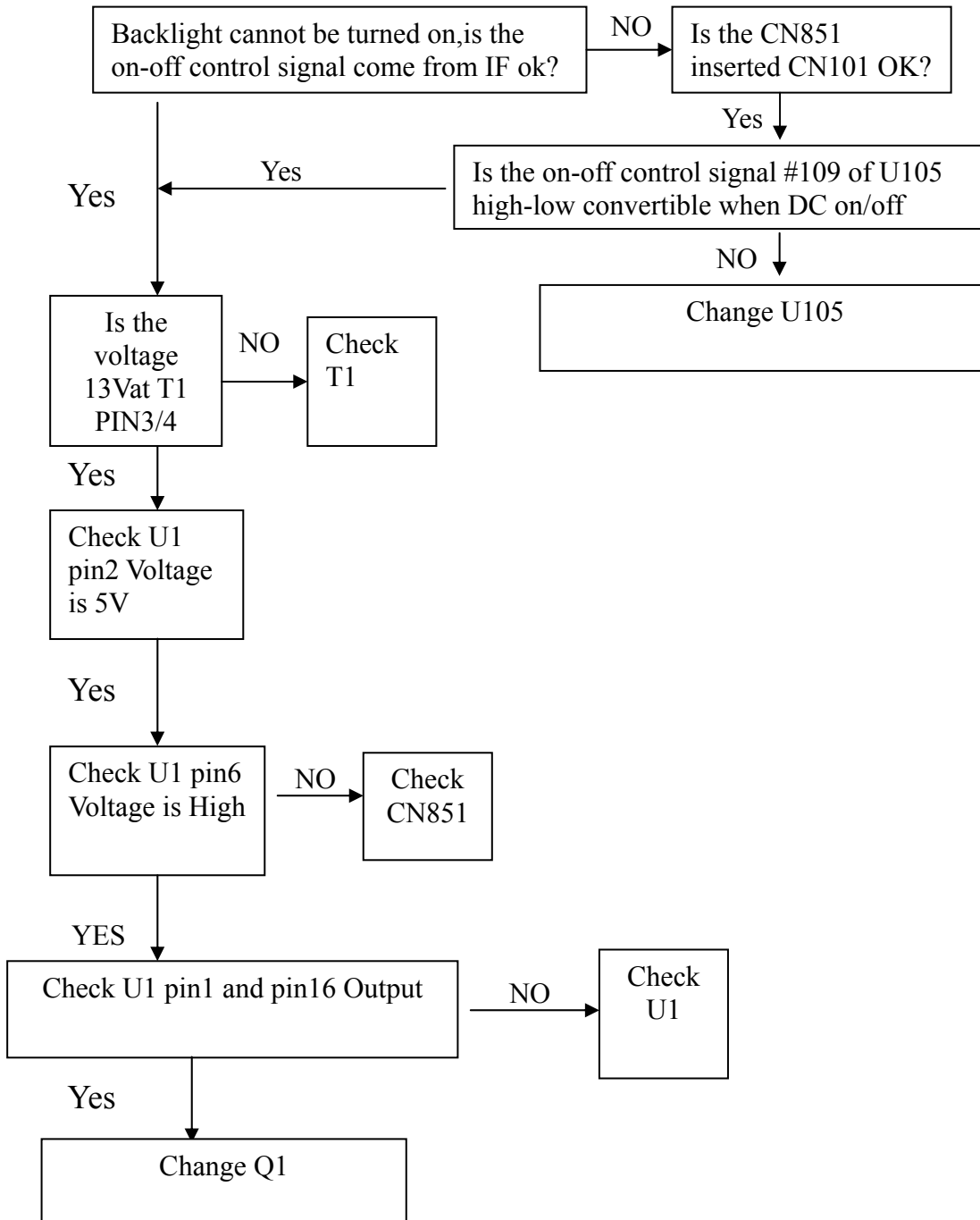
2. No power supply



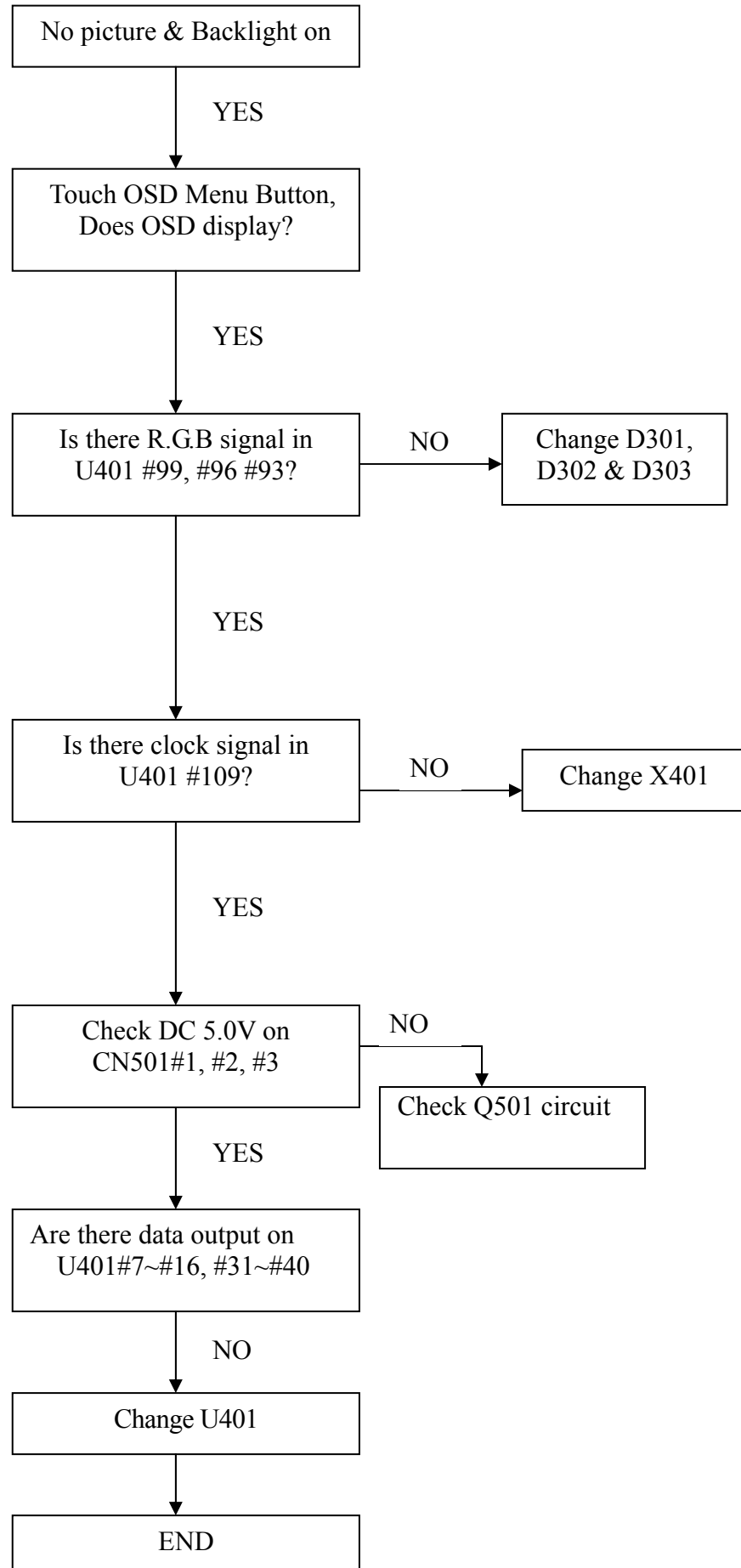
3. Power LED Amber



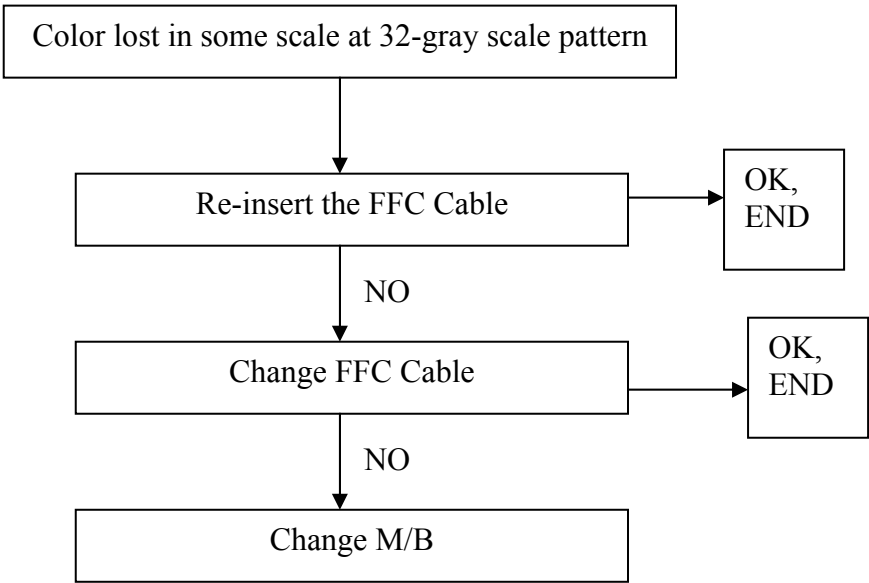
4. Power (include IF +5V and +3.3V) supply normal (key function OK, but backlight can't be turned on)



5. No picture & Backlight on

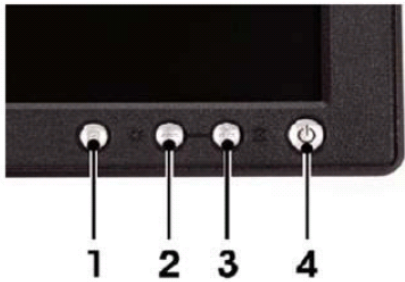


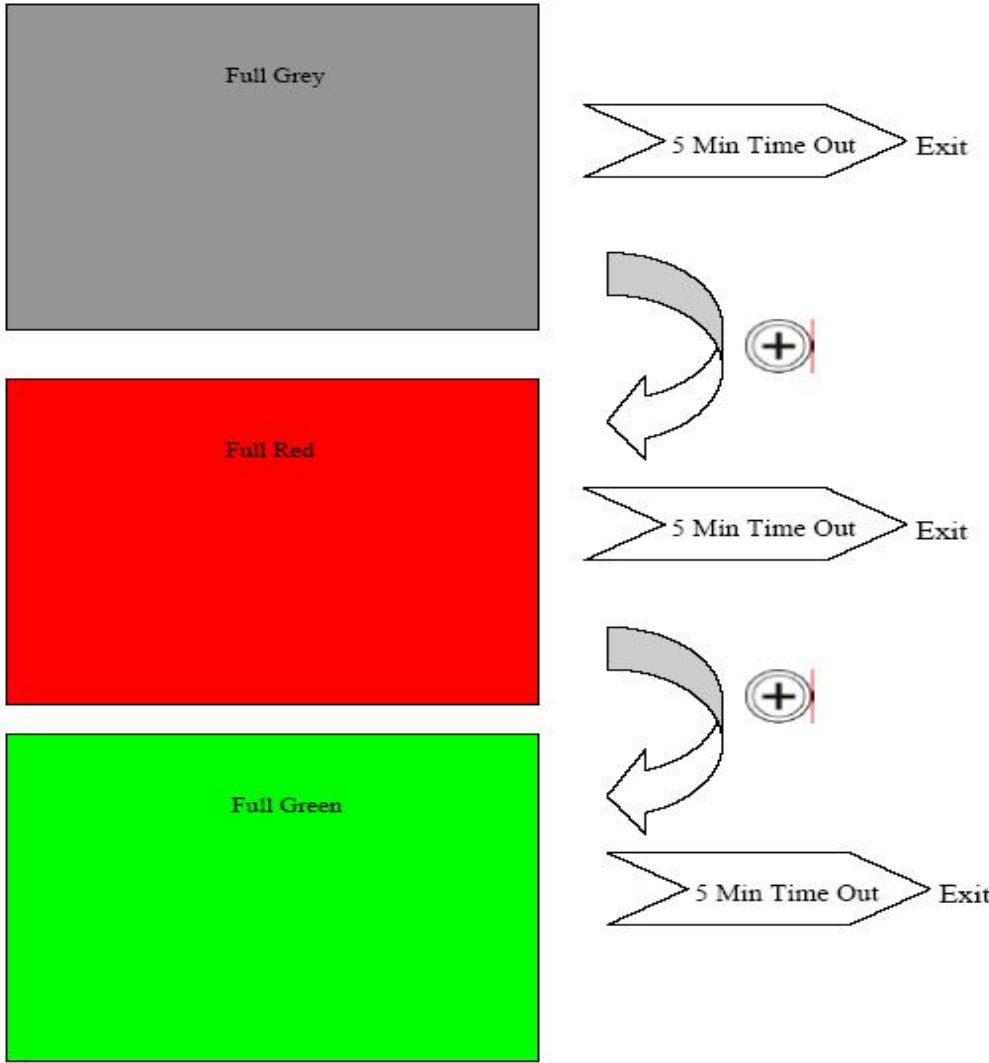
6. At 32-gray scale pattern, color lost in some scale

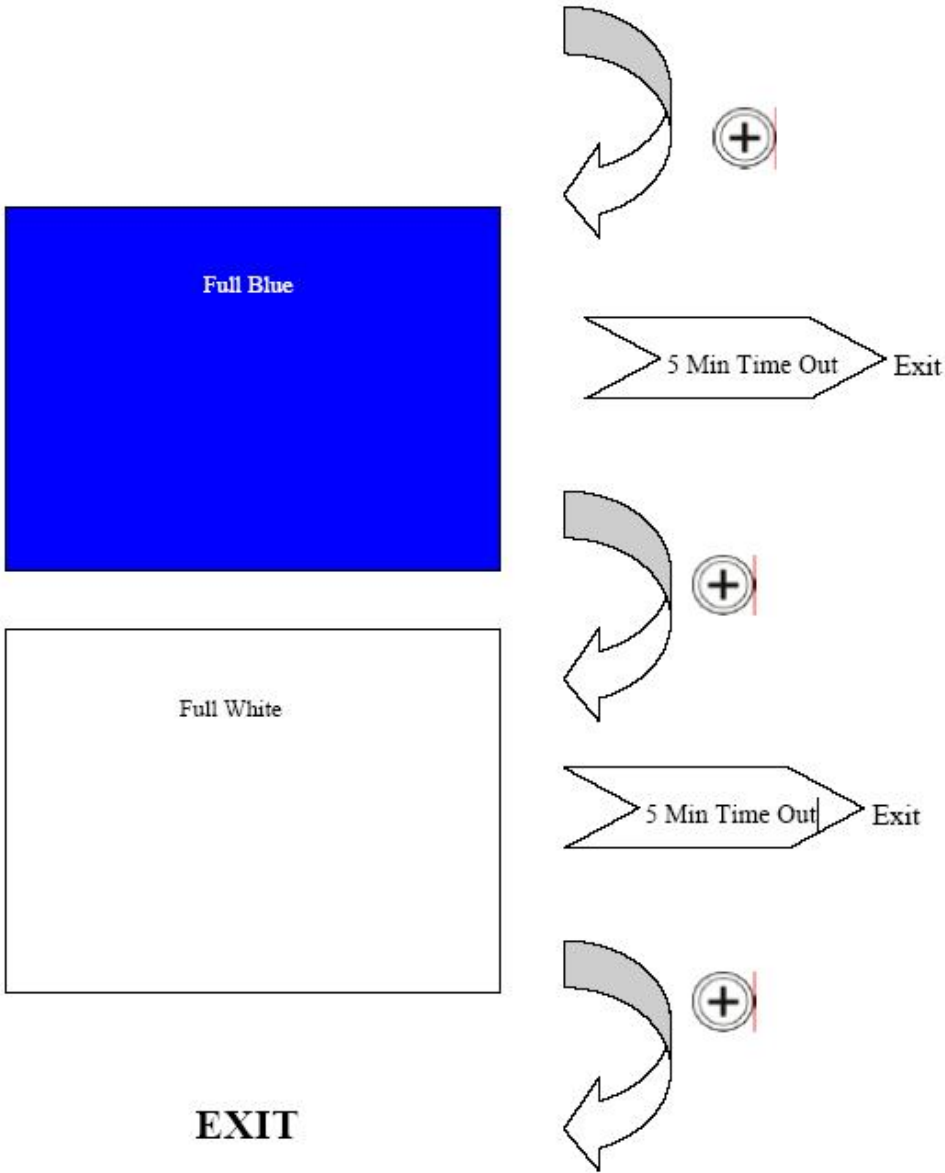


7. Diagnostic Test Pattern

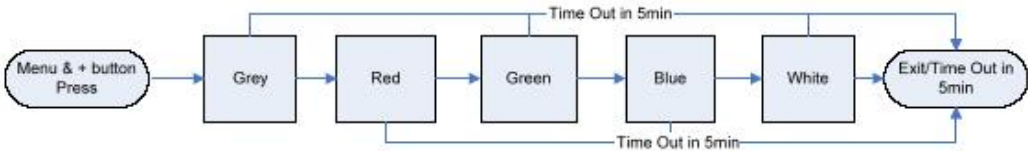
1. Press “menu” and “+” simultaneously and hold for 2 sec to enter to the diagnostic.
Check for line defects from the gray color test screen.
2. Press “+” to advance to the next test pattern - Red color screen. Check for partial block dot(s) - Red color dead pixel. Continue this for the Green & Blue color.
3. When in White color test screen, check for white color uniformity and if there white color appears greenish/reddish, etc.

FY10 Entry E170S & E190S only		Press & hold 1 (Menu) & 3 (+) simultaneously for 2 sec.	3 (+)
--	---	--	-------





Test Pattern flow:



Chapter 7- RECOMMENDED PART LIST

Critical Parts List

E190S Critical Components List

Content	PN	Description	Supplier	Usage	Supplier Location
IF BD	412040098880R	IC GM2621-LF-BC,QFP-128(GENESI S)RoHS	ST,	Scaler	U401,
	430631050060R	WFR. 5P 2.0MM 180° W/L ROHS	FOXCONN, JOWLE,	To Power Board Connector	CN601,
	412000494310R	IC PM25LV020-100SCE SOIC8(PMC)RoHS	PMC,	Serial Flash	U402,
	412000721560R	IC W25X20AVNIG SOIC8(WINBOND) RoHS	WINBOND		
	412000661620R	IC MX25L2025MC-12G (MXIC)RoH	MXIC,		
	412000494190R	IC SST25LF020A-33-4C-SAE SOIC8(SST)ROHS	SST,		
	412000332130R	IC AP1117D33LA 3.3V (ANACHIP) TO-252-3L,	ANACHIP,	DC to DC convert	U601,
	412000332020R	IC LD1117AL-3.3-A TO-252(UTC)RoHS	UTC,		
	412000332830R	IC AS1117R-3.3.TR-LF,TO-252(A1 SEMI)RoHS	A1SEMI,		
	412000333990R	IC CAT24FC02W-TE13 SOIC-8 RoHS (CATALYST	CATALYST,	EEPROM	U301,
	412000769830R	IC AS24C02ID-18/TR-LF SOP8(A1SEMI)	A1SEMI,		
	412000480280R	IC M24C02-RMN6TP SO8(ST)RoHS	ST,		
	412000435480R	IC AT24C02BN-10SU-1.8 SOIC8 2K (ATMEL)Ro	ATMEL,		
	412000480990R	IC CAT24C02WI-TE13 SOIC-8(CATALYST)RoHS	CATALYST,	DC to DC convert	U602,
	412000330130R	IC AP1117E18LA 1.8V (ANACHIP) SOT223-3L	ANACHIP,		
	412000330830R	IC AS1117L-1.8/TR-LF,SOT223(A1 SEMI)RoHS	A1SEMI,		
	412000330020R	IC LD1117AL-1.8V-A SOT223(UTC) RoHS	UTC,		
	492421300100H	PCB, I/F ,2/OSP /FR4/16, LE19S1 HF	EXPRESS, SHENG HUA	PCB	IF PCB
	492421500000H	PCB, K/P ,2/OSP /FR4/08, LE19S1 HF10	EXPRESS, SHENG HUA	PCB	KP PCB
PI BD	412000453820R	IC LD7575PS SOP8(LEADTREND) RoHS	LEADTREN D,	PWM Control IC for Power	U850
	412000783630R	IC INL816GN SOP16(O2 MICRO)	O2	PWM Control IC for Inverter	U1
	426000091190R	XFMR SW DIP ER28 TP4 920uH SPW-119 ROHS	FOXCONN,	Transfer AC to 5V/13V	T850
			FRONTIER		
			LISHIN		
			MEIKAI,		
	426000090540R	XFMR SW 955mH,SPW-054,RoHS	DARFON	High-vol. transformer for CCFLs	T1
			FOXCONN		
			FRONTIER		
			LISHIN,		
	420431014083R	CAP SEK 100uF/450V M,105°C CF,18x40(2.5)	ELITE	Filter AC line voltage to DC	C854
			SAMXON		
			SU'SCON,		

	410050114290R	XSTR AP2764AI-A N-CH 650V/9A TO-220CFM	APEC,	Switch MOS	Q850
	410050103050R	XSTR FMA09N65GX N-CH TO-220F(FUJI) RoHS	FUJI,		
	410050057280R	XSTR STP8NK80ZFP N-CH TO220FP (ST)	ST,		
	492421400100H	PCB,PCB,P/I ,1/OSP /CEM1/16,LE19S1,HF	HUIHO, TATCHUN,	PCB	
	492422200000H	PCB,CRL-I ,2/OSP /FR4/12(INL816)LE19S1,H	EXPRESS, SHENG HUA	PCB	
	490712100200H	PCB,CONTROL(PWR LD7575),LE1521	EXPRESS	PCB	

ATTACHMENT 1- Bill of Material

MNT BOM



E190Sf MNT BOM

Lv	Item	Component no.	Object description	Quantity	BU	Un	Rev	Lev
1	10	453070800150R	PWR CORD 10A/125V BLK 6FT UL/CSA SVT 3Cx	1	PC		C	
1	20	453010100320R	CABLE D-SUB 15P MALE 6FT BLACK/BLUE AB 8	1	PC		B	
1	30	714070HA2000R	ASSY,FINAL(B)W/O SPK,LE19S1-A10(E190Sf)	1	PC		A	
1	40	713100016000R	ASSY, PACKAGE, PACK, DAO,LE19S1	1	PC		A	
1		714070HA2000R	ASSY,FINAL(B)W/O SPK,LE19S1-A10(E190Sf)					
2	10	509012202100R	SCREW,I,CROSS,T.T-2*2.5,Zn,ROHS	2	PC		A	
2	20	509116610510R	SCREW,P,CROSS,M4*10,BLACK-NL(NYLOK)	4	PC		A	
2	30	503020004409R	RUBBER,FOOT,10x20x3.8mm	2	PC		A	
2	40	714050024200R	ASS'Y BACK COVER LE19S1	1	PC		A	
2	50	714000001410R	ASSY,RELEASE BUTTON(B), LE1X28	1	PC		A	
2	60	714020021000R	ASS'Y STAND LE19S1	1	PC		A	
2	70	714030027001R	ASS'Y FRONT BEZEL ,LE19S1	1	PC		A	
2	80	714080HA2000R	ASSY,PANEL,W/O SPK,LE19S1-A10(E190Sf)	1	PC		A	
1		713100016000R	ASSY, PACKAGE, PACK, DAO,LE19S1					
2	10	506140005800R	LABEL BARCODE LE1963	1	PC		B	
2	20	506250001900R	LABEL,AGENCY,LE19S1	1	PC		A	
2	30	506431011200R	FILM,SCREEN,PROTECTION,PRINTED,LE19S1	1	PC		A	
2	40	506380001400R	TAPE 3M-897 12x45000mm	0.00333	PC		A	
2	50	506280011401R	POSTER,QUICK SETUP,WEST, LE19S1	1	PC		A	
2	60	703500013600R	KIT,ACCESSORY, DOC, DAO, LE19S1	1	PC		A	
2	70	506120300060R	BAG, PLASTIC,L670*W440mm(PRINTED), LE22E	1	PC		A	
2	80	506120004400R	BAG PLASTIC L540xW460xT0.05mm(PRINTED)LE	1	PC		B	
2	90	506020003700R	CARTON,DELL(WWW), LE19S1	1	PC		A	
2	100	506060017600R	CUSHION TOP,LE19S1	1	PC		A	
2	110	506060017601R	CUSHION BUTTOM ,LE19S1	1	PC		A	
2	120	506340004700R	LABEL BLANK 101X50mm DELL EMEA CARTON	1	PC		A	
2	130	506380002622R	TAPE, WRAPPING TYPE PRINTED(DELL), BLACK	0.00134	ROL		A	
2	140	713000100500R	ASSY PACK,20STD,LE19S1		PC		A	
2	140	713000100501R	ASSY PACK,40STD,LE19S1	1	PC		A	
2	140	713000100502R	ASSY PACK,40HQ,LE19S1		PC		A	
2	140	713000100506R	ASSY PACK,AIR CARGO (20STD),LE19S1		PC		A	

2	140 713000100507R	ASSY PACK,AIR CARGO (40STD),LE19S1	PC	A
2	714050024200R	ASS'Y BACK COVER LE19S1		
3	10 501020233000R	BACK COVER LE19S1	1 PC	A
3	20 502210100500R	KENSINGTON TON,LE1966	1 PC	A
2	714000001410R	ASSY,RELEASE BUTTON(B), LE1X28		
3	10 501030202310R	BUTTON VESA RELEASE(B) LE1X28	1 PC	A
3	20 502030100200R	LATCH VESA RELEASE LE1X13	1 PC	A
2	714030027001R	ASS'Y FRONT BEZEL ,LE19S1		
3	10 501010226500R	FRONT BEZEL LE19S1	1 PC	A
3	20 750020201100R	SUB-BUTTON,LE19S1	1 PC	A
3	30 506102000600R	LOGO PLATE DELL LE1X13	1 PC	A
2	714080HA2000R	ASSY,PANEL,W/O SPK,LE19S1-A10(E190Sf)		
3	10 631102092520RD	LCP 19" LM190E08-TLJ3(A)(LGD)ROHS	1 PC	A
3	10 631102092530RD	LCP 19" LM190E08-TLJ4(A)(LGD)ROHS	PC	A
3	20 792811300A00R	PCBA,I/F BOARD,W/O SPK,LE19S1-A10 ROHS	1 PC	AA
3	30 792811400700R	PCBA,P/I BOARD,W/O SPK,LE19S1-710 ROHS	1 PC	AA
3	40 792811500000R	PCBA,KEYPAD BOARD,LE19S1 ROHS	1 PC	AA
3	50 430303002450R	HRN LVDS FFC 30P 207mm,W/CORE&LOCK	1 PC	A
3	60 509016306200R	SCREW,I,CROSS,M3*6,Zn-Cc	2 PC	A
3	70 509000001000R	BOLT,#4-40x12.5,Ni ROHS	2 PC	A
3	80 509016305200R	SCREW,I,CROSS,M3*5,Zn-Cc	4 PC	A
3	90 509112308102R	SCREW,P,CROSS,W/WAS,M3*8,Zn-Cc	4 PC	A
3	100 509476606100R	SCREW,B,CROSS W/W(T)M4*6,ZnROHS	1 PC	A
3	120 505040212900R	INSULATOR,TOP,PC,LE19S1	1 PC	A
3	130 701000003700R	ASSY,CHASSIS,LE1966	1 PC	D
3	140 506381000800R	TAPE,ACE,(PC=85x45mm)LE1913	1 PC	A
3	150 505040206510R	INSULATOR,MYLAR,BOTTOM,180.6x100x0.25mm	1 PC	A
3	160 509112304100R	SCREW BTP3x4C3UC,ROHS	2 PC	A
2	713000100500R	ASSY PACK,20STD,LE19S1		
3	10 506432001100R	SLIP SHEET,L1280XW1000X100MM	PC	B
3	20 506432001500R	SLIP SHEET,L1130xW886xH100mm, LE1711 ROH	PC	A
3	30 506037013200R	CARDBOARD,COVER,L1233*W980*H100*T3mm, LE	PC	A
3	40 506037003901R	CARDBOARD,COVER,L986*W822*H100*T3mm,LE19	PC	A
3	50 506039000101R	CORNER PAPER 1000x50x50xT3mmLE1711	PC	A
3	60 506039007800R	CORNER PAPER 1150x50x50xT3mm LE1511	PC	A
3	70 506431000300R	FILM,PE 500mmx900M ROHS	PC	A
3	80 506380002612R	TAPE,WRAPPING TYPE,50Mx82mm	ROL	A
3	90 506120400100R	BAG AIR DUNNAGE 2000x1000mmLE1X03 ROHS	PC	A
2	713000100501R	ASSY PACK,40STD,LE19S1		
3	10 506432001100R	SLIP SHEET,L1280XW1000X100MM	0.01538 PC	B
3	20 506432001500R	SLIP SHEET,L1130xW886xH100mm, LE1711 ROH	0.01538 PC	A
3	30 506037013200R	CARDBOARD,COVER,L1233*W980*H100*T3mm, LE	0.03077 PC	A
3	40 506037003901R	CARDBOARD,COVER,L986*W822*H100*T3mm,LE19	0.03077 PC	A
3	50 506039000101R	CORNER PAPER 1000x50x50xT3mmLE1711	0.06154 PC	A
3	60 506039007800R	CORNER PAPER 1150x50x50xT3mm LE1511	0.06154 PC	A
3	70 506431000300R	FILM,PE 500mmx900M ROHS	0.00248 PC	A
3	80 506380002612R	TAPE,WRAPPING TYPE,50Mx82mm	0.00039 ROL	A
2	713000100502R	ASSY PACK,40HQ,LE19S1		

3	10 506432001100R	SLIP SHEET,L1280XW1000X100MM	PC	B
3	20 506432001500R	SLIP SHEET,L1130xW886xH100mm, LE1711 ROH	PC	A
3	30 506037013200R	CARDBOARD,COVER,L1233*W980*H100*T3mm, LE	PC	A
3	40 506037003901R	CARDBOARD,COVER,L986*W822*H100*T3mm,LE19	PC	A
3	50 506039007800R	CORNER PAPER 1150x50x50xT3mm LE1511	PC	A
3	60 506039006100R	CORNER PAPER 1250x50x50xT3mm LE963 ROH	PC	A
3	70 506431000300R	FILM,PE 500mmx900M ROHS	PC	A
3	80 506380002612R	TAPE,WRAPPING TYPE,50Mx82mm	ROL	A
2	713000100506R	ASSY PACK,AIR CARGO (20STD),LE19S1		
3	10 506150015000R	PALLET L1233*W980*H120mm, LE19S1	PC	A
3	20 506150003901R	PALLET L986*W822*H120mm, LE19S1	PC	A
3	30 506037013200R	CARDBOARD,COVER,L1233*W980*H100*T3mm, LE	PC	A
3	40 506037003901R	CARDBOARD,COVER,L986*W822*H100*T3mm,LE19	PC	A
3	50 506039000101R	CORNER PAPER 1000x50x50xT3mmLE1711	PC	A
3	60 506039001400R	CORNER PAPER 200x50x50mm ROHS	PC	A
3	70 506431000300R	FILM,PE 500mmx900M ROHS	PC	A
3	80 506120400100R	BAG AIR DUNNAGE 2000x1000mmLE1X03 ROHS	PC	A
3	90 506380002612R	TAPE,WRAPPING TYPE,50Mx82mm	ROL	A
2	713000100507R	ASSY PACK,AIR CARGO (40STD),LE19S1		
3	10 506150015000R	PALLET L1233*W980*H120mm, LE19S1	PC	A
3	20 506150003901R	PALLET L986*W822*H120mm, LE19S1	PC	A
3	30 506037013200R	CARDBOARD,COVER,L1233*W980*H100*T3mm, LE	PC	A
3	40 506037003901R	CARDBOARD,COVER,L986*W822*H100*T3mm,LE19	PC	A
3	50 506039000101R	CORNER PAPER 1000x50x50xT3mmLE1711	PC	A
3	60 506039001400R	CORNER PAPER 200x50x50mm ROHS	PC	A
3	70 506431000300R	FILM,PE 500mmx900M ROHS	PC	A
3	80 506380002612R	TAPE,WRAPPING TYPE,50Mx82mm	ROL	A
3	750020201100R	SUB-BUTTON,LE19S1		
4	10 501030214800R	BUTTON,LE19S1	1 PC	A
3	701000003700R	ASSY,CHASSIS,LE1966		
4	10 502090306100R	CHASSIS,LE1966	1 PC	D
4	20 502020300800R	BRACKET VESA LEFT LE1X13	1 PC	A
4	30 502020300810R	BRACKET VESA RIGHT LE1X13	1 PC	A
4	40 504010000300R	SPRING Φ0.5*D5*H17	2 PC	A
4	50 509216304201R	SCREW,F,CROSS,M3*4,Zn-Cc	2 PC	A
4	60 502040000300R	SHIELD SLIDE LE1X13	1 PC	B
4	70 502040400600R	SHIELD EMI LP2207	6 PC	A

PCBA PI BOM



E190Si PCBA PI
BOM

ITEM P/N	Description	Supplier	Usage	Location
792811400700R	PCBA,P/I BOARD,W/O SPK,LE19S1-710 ROHS			
10 792811420700R	PCBA,P/I BOARD,W/O SPK,MI,LE19S1-710 RO		1	
20 792811410700R	PCBA,P/I BOARD,W/O SPK,AI,LE19S1-710 RO		1	
30 792792100000R	PCBA,CONTROL/B(PWR LD7575),LP2261RoHS		1	
40 792812200700R	PCBA,CONTROL/B(INV INL816),LE19S1,		1	

RoHS				
50	735110012400R	ASSY,H/S,Q850,LE19S1,ROHS		1
70	511110000501R	SILICONE RTV RUBBER,UB-511(EURO)	EURO,	0.45
80	511110000103R	HOT-MELT ADHESIVES,UB-618	U-BOND,	1.5
80	511110000101R	HOT-MELT ADHESIVES (#526)	EXCELSTAR,	0
ITEM P/N	Description		Supplier	Usage Location
	735110012400R	ASSY,H/S,Q850,LE19S1,ROHS		
10	410050114290R	XSTR AP2764AI-A N-CH 650V/9A TO-220CFM	APEC,	1 Q850,
10	410050057280R	XSTR STP8NK80ZFP N-CH TO220FP (ST)	ST,	0
10	410050103050R	XSTR FMA09N65GX N-CH TO-220F(FUJI) RoHS	FUJI,	0
20	509146308102R	SCREW,PW,CROSS W/WAS,M3*8,Zn	GAOYI,YIJIE,	1
30	507200004200R	HEATSINK,35x16.7x10mm, LE1911	DMC,ORIENTAL POWER,ZHONGJIAN,	1
ITEM P/N	Description		Supplier	Usage Location
	792792100000R	PCBA,CONTROL/B(PWR LD7575),LP2261RoHS		
10	430632080020R	WFR. 8P 2.54mm 90°,HEADER,W/O PIN2,RoHS	CVILUX,FOXCONN,JOWLE,	1 CN852,
20	792792140000R	PCBA,CONTROL/B(PWR LD7575),SMD,LP2261,RO		1
30	511130001200R	SOLDER BAR,Sn96.5/Ag3.0/Cu0.5/Ni0.06/Ge0	TOMAS,	0.5
ITEM P/N	Description		Supplier	Usage Location
	792811410700R	PCBA,P/I BOARD,W/O SPK,AI,LE19S1-710 RO		
10	792811450700R	PCBA,P/I BOARD,W/O SPK,AI/A,LE19S1-710		1
20	792811460700R	PCBA,P/I BOARD,W/O SPK,AI/R,LE19S1-710		1
ITEM P/N	Description		Supplier	Usage Location
	792811420700R	PCBA,P/I BOARD,W/O SPK,MI,LE19S1-710 RO		
10	430637020030R	WFR. 2P P=3.5mm 90°W/LOCK,RoHS	CVILUX,FCN,FOXCONN,	2 CN1,CN2,
20	440149000350R	SKT AC 10A/250V U/C/V, H 1.0MM ROHS	TECX,	1 CN850,
30	418110051520R	CAP CD NPO 10pF 3KV J,S7.5, RoHS	JNC,SUCCESS(SEC),	1 C22,
30	418110058510R	CAP CD SL 10pF 3KV J,F7.5 RoHS CC45SL3FD	JNC,SUCCESS(SEC),	0
40	418103051920R	CAP CD NPO 3pF 3KV D,S7.5, RoHS	JNC,SUCCESS(SEC),	2 C20,C21,
40	418103058920R	CAP CD SL 3pF 3KV D,S7.5,RoHS	JNC,SUCCESS(SEC),	0
50	416202223620R	CAP MEY 2200pF 250V M Y2 Y5V,W /O FORMIN	JNC,POE,SUCCESS(SEC),	2 C850,C851,
60	416194743011R	CAP MEX 0.47uF 275V K X2,F15 RoHS	ARCOTRONIC,EUROPTRONIC,HJC,SCC,	1 C852,
70	420431014083R	CAP SEK 100uF/450V M,105°C CF,18x40(2.5)	ELITE,LELON,SAMXON,SU'S CON,	1 C854,
80	416213323620R	CAP MEY 3300pF 250V M Y1,F10mm W/O FORMI	JNC,POE,SUCCESS(SEC),	1 C860,
90	416304723510R	CAP PP 0.0047uF 250V J,F7.5 RoHS	EUROPTRONIC,HJC,SCC,	1 C875,
100	415502688551R	RES NKNP 2W 0.68Ω J, MINI,HK15,ROHS	FUTABA,QUEENMAO,TZAI YUAN,UNIOHM,欣統,	1 R869,
110	415350100550R	RES MOF 2W 10Ω J,MINI,HK15, RoHS	FUTABA,QUEENMAO,TZAI YUAN,UNIOHM,欣統,	2 R866,R862,
120	415350823550R	RES MOF 2W 82KΩ J,MINI,HK15 RoHS	FUTABA,QUEENMAO,TZAI YUAN,UNIOHM,欣統,	1 R880,
130	432009400701R	NTC 5Ω 4A 10ψ P=5mm, F RoHS	THINKING,UPPERMOST,	1 RT850,
140	412140002380R	IC LTV817M-PR VDE (LITE-ON) P=10mm RoHS	LITEON,	1 I850,
140	412000756150R	IC PS2561AL1-1-V-A D10(NEC)	NEC,	0
150	425000010530R	COIL CHK 5uH 7.8X10 CHK-053 0 181085R0L	CHILISIN,DARFON,EASYMA GNET,FOXCONN,FRONTIER ,TAICHANG,	2 L851,L852,

160 426000050070R	CHOK L-FILTER 12mH LIN-007 ET-20,RoHS	DARFON,FOXCONN,LISHIN, MEIKAI,TAICHANG,	1 L850,
170 411050012010R	DIO BRDG GBU405 600V/4A(TSC)RoHS	TSC,	1 D850,
170 411050012020R	DIO BRDG GBU4-06-BF52 600V/4A(FEC)RoHS	FRONTIER,	0
180 411090056022R	SCHTKYSR520F75-LF 200V/5A DO-201AD(FEC)	FRONTIER,	1 D854,
180 411090056452R	SCHTKYSR5200PT-A3 200V/5A DO-201AD(CHENM	CHENMKO,	0
180 411090056092R	SCHTKY MBR5200-F46 200V/5A DO-201AD(PANJ	PANJIT,	0
190 411090050022R	SCHTKY SR515F75-LF 150V/5A DO-201AD(FEC)	FRONTIER,	2 D856,D857,
190 411090050012R	SCHTKY SR5150PT-A3 150V/5A DO-201AD (CH	CHENMKO,	0
190 411090050092R	SCHTKY SB5150F46 150V/5A DO-201AD (PANJI	PANJIT,	0
200 426000090540R	XFMR SW 955mH,SPW-054,RoHS	DARFON,FOXCONN,FRONTI ER,LISHIN,TDK,	1 T1,
210 426000091190R	XFMR SW DIP ER28 TP4 920uH SPW-119 ROHS	FOXCONN,FRONTIER,LISHI N,MEIKAI,	1 T850,
220 430300500540R	HRN ASSY 5pin 100mm UL1007 #26 LOCK	FOXCONN,JVE,銳升,	1 CN851,

ITEM P/N	Description	Supplier	Usage	Location
792812200700R	PCBA,CONTROL/B(INV INL816),LE19S1, RoHS			
10 430632150010R	WFR. 15P 2.54mm 90°,HEADER,RoHS	CVILUX,FOXCONN,	1	CN5,
20 792812240700R	PCBA,CONTROL(INV INL816),SMD,LE19S1,ROHS		1	
30 511130001200R	SOLDER BAR,Sn96.5/Ag3.0/Cu0.5/Ni0.06/Ge0	TOMAS,	0.5	

ITEM P/N	Description	Supplier	Usage	Location
792792140000R	PCBA,CONTROL/B(PWR LD7575),SMD,LP2261,RO			
10 419312210060R	C SMD(0603) X7R 220PF/50V K RoHS	DARFON,TDK,WALSIN,YAGE O,	1	C846,
20 419311040060R	C SMD(0603) X7R 0.1uF/50V K RoHS	DARFON,TDK,WALSIN,YAGE O,	1	C848,
30 419311020060R	C SMD(0603) X7R 1000PF/50V K RoHS	DARFON,TDK,WALSIN,YAGE O,	1	C849,
50 414904020350R	RES SMD (1206) 20KΩ J,RT RoHS	TA-I,UNIOHM,WALSIN,YAGE O,	2	R843,R842,
60 414916010410R	RES SMD (0603) 100K F,RT RoHS	TA-I,UNIOHM,WALSIN,YAGE O,	1	R846,
70 414916200910R	RES SMD (0603) 20Ω F,RT,RoHS	TA-I,UNIOHM,WALSIN,YAGE O,	1	R848,
80 414916022150R	RES SMD (0603) 220Ω J,RT RoHS REV:A	TA-I,UNIOHM,WALSIN,YAGE O,	1	R849,
90 412000453820R	IC LD7575PS SOP8(LEADTREND) RoHS	LEADTREND,	1	U850,
100 490712100200H	PCB,CONTROL(PWR LD7575),LE1521	EXPRESS,SHENG HUA,	1	

ITEM P/N	Description	Supplier	Usage	Location
792811450700R	PCBA,P/I BOARD,W/O SPK,AI/A,LE19S1-710			
10 411032006020R	DIO FR10-10-LF 1000V/1A AT(FRO NTIER)RoH	FRONTIER,	1	D851,
10 411032006040R	DIO FR107 1000V/1A DO-41(MOSPE C)RoHS	MOSPEC,	0	
10 411020053090R	DIO PS1010R 1000V/1A DO-41(PAN JIT)RoHS	PANJIT,	0	
20 411020064090R	DIO ER104 400V/1A DO-41(PANJIT RoHS	PANJIT,	1	D852,
20 411032001020R	DIO SF10-04-LF 400V/1A DO-41(F RONTIER)R	FRONTIER,	0	
30 411020080090R	DIO P6KE170A 600W/100A DO-15 (PANJIT)	PANJIT,	1	D853,
30 411020080460R	DIO P6KE170A 600W/100A DO-15 (SECOS)	SECOS,	0	
30 411020080020R	DIO P6KE170A-LF 600W/100A DO-15(FEC)	FRONTIER,	0	
40 430613050100R	FUSE SLOW PICO II 5A/125V U/C,AT,ROHS	LITTELFUSE,	1	F851,

40	430613050101R FUSE SLOW 5A/125V U/C,AT,ROHS	WALTER,	0	
50	415211500140R RES MF 1/8W 150Ω F,AT,RoHS	QUEENMAO,TZAI YUAN,UNIOHM,欣統,	1	R20,
60	415237503140R RES MF 1/2W 750KΩ F AT MINI,ROHS	QUEENMAO,TZAI YUAN,UNIOHM,欣統,	2	R850,R851,
70	415213301140R RES MF 1/8W 3.3KΩ F,AT,RoHS	QUEENMAO,TZAI YUAN,UNIOHM,欣統,	1	R860,
80	415213601140R RES MF 1/8W 3.6KΩ F,AT ,ROHS	QUEENMAO,TZAI YUAN,UNIOHM,欣統,	1	R861,
90	415221009140R RES MF 1/4W 10Ω F,AT MINI,RoHS	QUEENMAO,TZAI YUAN,UNIOHM,欣統,	1	R856,
100	415222700140R RES MF 1/4W 270Ω F,AT,MINI,RoHS	QUEENMAO,TZAI YUAN,UNIOHM,欣統,	1	R867,
110	415211002140R RES MF 1/8W 10KΩ F,AT RoHS	QUEENMAO,TZAI YUAN,UNIOHM,欣統,	2	R855,R859,
120	415215101140R RES MF 1/8W 5.1KΩ F,AT,RoHS	QUEENMAO,TZAI YUAN,UNIOHM,欣統,	1	R858,
130	415212703140R RES MF 1/8W 270KΩ F,AT,RoHS	QUEENMAO,TZAI YUAN,UNIOHM,欣統,	1	R871,
140	414040208540R RES FSM 1W 0.2Ω J,AT MINI RoHS	FUTABA,QUEENMAO,TZAI YUAN,UNIOHM,欣統,	1	R853,
150	430405000000R JMPR ROLL/KG D=0.6mm,AT,RoHS 7.5MM	HOTRON,YUANYE,	200	J2,J4,J6,J7,
150	430405000000R JMPR ROLL/KG D=0.6mm,AT,RoHS 7.5MM	HOTRON,YUANYE,	0	
160	430405000000R JMPR ROLL/KG D=0.6mm,AT,RoHS 12.5MM	HOTRON,YUANYE,	100	J1,J3,
160	430405000000R JMPR ROLL/KG D=0.6mm,AT,RoHS 12.5MM	HOTRON,YUANYE,	0	
170	492421400100H PCB,PCB,P/I ,1/OSP /CEM1/16,LE19S1,HF	HUIHO,TATCHUN,	1	
180	432002200220R FERRTIE BEAD 3.5*6*0.65 AT,RoHS	CHILISIN,TAICHANG,	1	L854,
190	415211400140R RES MF 1/8W 140Ω F,AT,RoHS	QUEENMAO,TZAI YUAN,UNIOHM,欣統,	1	R21,
200	506140005700R LABEL,BARCODE,BLANK,33x7mm,ROHS,FOR PCB	HENGMINGDA,JIAYINMEI,KA IDA,	1	
ITEM P/N	Description	Supplier	Usage	Location
792811460700R	PCBA,P/I BOARD,W/O SPK,AI/R,LE19S1-710			
10 420221000530R	CAP HG 10uF 50V M,105℃ VT,5x11,RoHS	LELON,SAMXON,SU'SCON,	1	C855,
20 420426810261R	CAP SD 680UF/25V M 105℃ ST 10X20 ROHS	LELON,SAMXON,SU'SCON,	1	C25,
30 420424710260R	CAP SD 470uF/25V M 105℃ ST 10x16,RoHS	LELON,SAMXON,SU'SCON,	5	C863,C864,C867,C868, C869,
40 418210233030R	CAP CD X7R 1000pF/1KV K,VT 2X7R102K102K5	JNC,POE,SUCCESS(SEC),W ANSHENG,	2	C862,C866,
50 418210313030R	CAP CD X7R 0.01UF 50V K,VT,ROHS	JNC,POE,SUCCESS(SEC),W ANSHENG,	1	C859,
60 419111040030R	CAP MTL X7R 0.1uF 50V K,VT, RoHS	JNC,POE,SUCCESS(SEC),	2	C871,C876,
70 430613830290R	FUSE TIME LAG 3.15A/250V,RoHS	BELFUSE,CONQUER,LITTEL FUSE,WALTER,	1	F850,
80 412022002240R	IC KA431AZ 1%,VT (FAIRCHILD) RoHS	FAIRCHILD,	1	I851,
80 412022002550R	IC AME431BAJATB25Z TO-92-3(AME RoHS	AME,	0	
80 412022002830R	IC AS431 TO-92 VT(A1SEMI)RoHS	A1SEMI,	0	
80 412022002440R	IC AS431BZTR-E1 TO-92(BCD) RoHS	BCD,	0	
90 418210133030R	CAP CD X7R 100pF 1KV K VT RoHS	JNC,POE,SUCCESS(SEC),	1	C872,
ITEM P/N	Description	Supplier	Usage	Location
792812240700R	PCBA,CONTROL(INV INL816),SMD,LE19S1,ROHS			
10 419311053070R	C SMD(0805) X7R 1UF/25V K ROHS REV:A	DARFON,TDK,WALSIN,YAGE O,	1	C1,
10 419311054070R	C SMD(0805) X7R 1uF/16V K RoHS REV:A	DARFON,TDK,WALSIN,YAGE O,	0	
20 419311020060R	C SMD(0603) X7R 1000PF/50V K RoHS	DARFON,TDK,WALSIN,YAGE O,	1	C2,
30 419312254070R	C SMD(0805) X7R 2.2uF 16V K RoHS	DARFON,MURATA,TAIYO,TD K,WALSIN,YAGEO,	1	C3,

40 419314730060R C SMD (0603) X7R 0.047uF 50V,K RoHS	DARFON,TDK,WALSIN,YAGE O,	1 C5,
50 419312720060R C SMD(0603) X7R 2700PF/50V K RoHS	DARFON,TDK,WALSIN,YAGE O,	2 C7,C8,
60 419313320070R C SMD(0805) X7R 3300PF/50V K RoHS	DARFON,TDK,WALSIN,YAGE O,	2 C9,C10,
70 411020047210R DIO BAV70 85V SOT23 (PHILIPS) RoHS	PHILIPS,	1 D1,
70 411020047020R DIO BAV70-LF, 70V SOT-23(FEC) ROHS	FRONTIER,	0
80 410500070290R XSTR AP9971GM,N-CH,SO8(APEC) RoHS	APEC,	1 Q1,
80 410050071380R XSTR AM9945N-T1-PF N-CH,SO8(AP)RoHS	AP,	0
90 414908100910R RES SMD(0805)10Ω F,RT ROHS	TA-I,UNIOHM,WALSIN,YAGE O,	1 R1,
100 414908010350R RES SMD (0805) 10KΩ J,RT RoHS REV:A	TA-I,UNIOHM,WALSIN,YAGE O,	3 R2,R3,R13,
110 414916560310R RES SMD (0603) 560KΩ F,RT,RoHS	TA-I,UNIOHM,WALSIN,YAGE O,	1 R4,
120 414916169310R RES SMD (0603) 169KΩ F,RT,RoHS	TA-I,UNIOHM,WALSIN,YAGE O,	1 R5,
130 414916010450R RES SMD (0603) 100KΩ J,RT REV:A RoHS	TA-I,UNIOHM,WALSIN,YAGE O,	2 R11,R12,
140 414916330210R RES SMD (0603) 33KΩ F,RT RoHS	TA-I,UNIOHM,WALSIN,YAGE O,	2 R7,R8,
150 414904200910R RES SMD (1206) 20Ω F,RT ROHS	TA-I,UNIOHM,WALSIN,YAGE O,	2 R9,R10,
160 412000783630R IC INL816GN SOP16(O2 MICRO)	O2,	1 U1,
170 492422200000H PCB,CRL-I ,2/OSP /FR4/12(INL816)LE19S1,H	EXPRESS,SHENG HUA,	1

PCBA IF BOM



E190S PCBA IF
BOM

ITEM P/N	Description	Supplier	Usage	Location
792811300400R	PCBA,I/F BOARD,W/O SPK,LE19S1-410 ROHS			
10 792811320700R	PCBA,I/F BOARD,W/O SPK,MI,LE19S1-710 RO		1	
20 792811340700R	PCBA,I/F BOARD,W/O SPK,SMT,LE19S1-710 R		1	
30 629030029120R	PROGRAM,W/O SPK,LE19S1-410 ROHS		1	
40 506140005700R	LABEL,BARCODE,BLANK,33x7mm, ROHS,FOR PCB	HENGMINGDA,JIAYINMEI,KA IDA,	1	
ITEM P/N	Description	Supplier	Usage	Location
792811320700R	PCBA,I/F BOARD,W/O SPK,MI,LE19S1-710 RO			
10 430631050060R	WFR. 5P 2.0MM 180° W/L ROHS	FOXCONN,JOWLE,	1	CN601,
20 440819015030R	CON D-SUB FEM.15P RA W/O SCREW DZ11AA1-H	DLK,FOXCONN,TEKCON,ZJ GHJ,	1	CN301,
30 432008010270R	XTAL 14.31818MHz HC-49US DIP 16pF 30PPM	HARMONY,HUAN MOUN,TXC,ZGC,	1	X401,
40 420424700440R	CAP SD 47UF/16V M 105°C,VT2.5,5X11 ROHS	LELON,SAMXON,SU'SCON,	2	C504,C603,
50 420421010440R	CAP SD 100uF 16V M,105°C VT2.5,5x 11,ROH	LELON,SAMXON,SU'SCON,	1	C602,
60 430300801560R	HRN ASS'Y 8P 305MM UL1571#28 WITH LOCK R	FOXCONN,HEIGHTEN,	1	CN401,
ITEM P/N	Description	Supplier	Usage	Location
792811340700R	PCBA,I/F BOARD,W/O SPK,SMT,LE19S1-710 R			

10 419311044010R C SMD(0402) X7R 0.1uF/16V,K,RoHS	TDK,WALSIN,YAGEO,	30	C505,C503,C502,C435, C431,C430,C429,C428, C426,C424,C423,C418, C411,C410,C409,C408, C407,C405,C404,C310, C312,C601,C605,C604, C606,C434,C440,C441, C443,C444,
20 419302700510R C SMD(0402) NPO 27PF/50V J RoHS	MURATA,TDK,WALSIN,YAGE O,	2	C307,C308,
30 419301010510R C SMD(0402) NPO 100PF/50V J,RoHS	MURATA,TDK,WALSIN,YAGE O,	2	C311,C309,
40 419301000510R C SMD(0402) NPO 10PF/50V J,RoHS	MURATA,TDK,WALSIN,YAGE O,	2	C413,C414,
50 411020026210R DIO BAV99 350mW 70V SOT-23(PHI RoHS	PHILIPS,	3	D301,D302,D303,
50 411020026090R DIO BAV99 350mW 75V SOT-23(PEC RoHS	PANJIT,	0	
50 411020026020R DIO BAV99-LF 350mW 70V SOT-23 (FEC)RoHS	FRONTIER,	0	
60 411020047210R DIO BAV70 85V SOT23 (PHILIPS) RoHS	PHILIPS,	1	D306,
60 411020047020R DIO BAV70-LF, 70V SOT-23(FEC) ROHS	FRONTIER,	0	
70 432002319041R BEAD CORE SMD(0603)19Ω 500mA, SBK160808	CHILISIN,TAI-TECH,	6	L301,L302,L303,L401,L 402,L405,
80 432002312144R BEAD CORE SMD(0603)120Ω 300mA SBK160808	CHILISIN,TAI-TECH,	2	L410,L407,
90 432002360111R BEAD CORE SMD(0805) 600Ω 2A PBY201209T-	CHILISIN,MAGLAYERS,TAI-T ECH,	3	L414,L412,L601,
100 432002330140R BEAD CORE SMD(0603)300Ω 200mA RoHS	CHILISIN,MAGLAYERS,TAI-T ECH,	5	L413,L411,L403,L404,L 406,
110 410500045440R XSTR LMBT3904LT1G NPN 200mA 40V SOT23(LRC,	1	Q502,
110 410500045210R XSTR PMBT3904 NPN 200MA,40V SOT23(PHILIP	PHILIPS,	0	
110 410500045140R XSTR MMBT3904LT1G NPN 200MA 40V SOT23(ON	ON SEMI,	0	
120 410060007270R XSTR AO3419 P-CH,SOT23(AOS)RoHS	AOS,	1	Q501,
120 410060011390R XSTR ASM2307M/TR-LF P-CH SOT-23(A1SEMI)R	A1SEMI,	0	
120 410500068290R XSTR AP2305GN P-CH SOT23(APEC) RoHS	APEC,	0	
130 414918047250R RES SMD (0402) 4.7KΩ J,RT,RoHS	TA-I,UNIOHM,WALSIN,YAGE O,	11	R430,R413,R412,R411, R410,R409,R408,R314, R313,R312,R501,
140 414918010250R RES SMD (0402) 1KΩ J,RT,RoHS	TA-I,UNIOHM,WALSIN,YAGE O,	4	R428,R427,R426,R425,
150 414918750910R RES SMD (0402) 75Ω F,RT,RoHS	TA-I,UNIOHM,WALSIN,YAGE O,	3	R306,R305,R304,
160 414918560910R RES SMD (0402) 56Ω F,RT,RoHS	TA-I,UNIOHM,WALSIN,YAGE O,	5	R316,R315,R303,R302, R301,
170 414918010150R RES SMD (0402) 100Ω J,RT,RoHS	TA-I,UNIOHM,WALSIN,YAGE O,	10	R404,R405,R319,R318, R317,R311,R310,R309, R308,R307,

180 414918010350R RES SMD (0402) 10KΩ J,RT,RoHS	TA-I,UNIOHM,WALSIN,YAGEO,	R502,R429,R420,R419, 11 R418,R415,R414,R424, R423,R422,R421,
190 414918100210R RES SMD (0402) 10KΩ F,RT,RoHS	TA-I,UNIOHM,WALSIN,YAGEO,	1 R416,
200 414918200210R RES SMD (0402) 20KΩ F,RT,RoHS	TA-I,UNIOHM,WALSIN,YAGEO,	2 R503,R417,
210 412040098880R IC GM2621-LF-BC,QFP-128(ST)ROHS	ST,	1 U401,
220 412000332990H IC EC50117KAG 3.3V TO-252(E-CMOS)	E-CMOS,	1 U601,
220 412000332020R IC LD1117AL-3.3-A TO-252(UTC)RoHS	UTC,	0
220 412000332830R IC AS1117R-3.3.TR-LF,TO-252(A1 SEMI)RoHS	A1SEMI,	0
230 412000435481R IC AT24C02BN-SH-T 2K SOIC8(ATMEL)RoHS	ATMEL,	1 U301,
230 412000769830R IC AS24C02ID-18/TR-LF SOP8(A1SEMI)	A1SEMI,	0
230 412000480280R IC M24C02-RMN6TP SO8(ST)RoHS	ST,	0
230 412000480990R IC CAT24C02WI-TE13 SOIC-8(CATALYST)RoHS	CATALYST,	0
240 412000330130R IC AP1117E18LA 1.8V (ANACHIP) SOT223-3L	ANACHIP,	1 U602,
240 412000330830R IC AS1117L-1.8/TR-LF,SOT223(A1 SEMI)RoHS	A1SEMI,	0
240 412000599990H IC EC50117BBG 1.8V SOT223(E-CMOS)	E-CMOS,	0
250 411130962950R ZENER 6.2V MMSZ5234B SOD-123(PANJIT)RoH	PANJIT,	ZD306,ZD305,ZD304,Z 10 D303,ZD302,ZD301,ZD 401,ZD402,ZD403,ZD4 06,
250 411121462950R ZENER 6.2V BZT52-C6V2 SOD-123(WILLAS)ROH	WILLAS,	0
250 411131562950R ZENER 6.2V BZT52C6V2-7-F SOD-123(DIODES)	DIODES,	0
260 419314755050R C SMD(1206) X7R 4.7uF/10V K RoHS	MURATA,TAIYO,TDK,WALSI N,YAGEO,	5 C442,C427,C412,C415, C506,
260 419354755050R C SMD(1206) X5R 4.7uF/10V,K,RoHS	MURATA,TAIYO,TDK,WALSI N,YAGEO,	0
270 444099030040R CON, SMD 1.0MM 30PIN with lock RoHS	CVILUX,P-TWO,	1 CN501,
280 419314733010R C SMD(0402) X7R 0.047uF/25V K,RoHS	TDK,WALSIN,YAGEO,	6 C306,C305,C304,C303, C302,C301,
280 419314734010R C SMD(0402) X7R 0.047uF/16V K,RoHS	TDK,WALSIN,YAGEO,	0
290 412000494310R IC PM25LV020-100SCE SOIC8(PMC)RoHS	PMC,	1 U402,
290 412000721560R IC W25X20AVSNIG SOIC8(WINBOND) RoHS	WINBOND,	0
290 412000494190R IC SST25LF020A-33-4C-SAE SOIC8(SST)ROHS	SST,	0
310 414918022250R RES SMD (0402) 2.2KΩ J,RT,RoHS	TA-I,UNIOHM,WALSIN,YAGEO,	2 R320,R321,
320 414918051150R RES SMD (0402) 510Ω J,RT,RoHS	TA-I,UNIOHM,WALSIN,YAGEO,	R505,R506,R507,R508, 10 R509,R510,R511,R512, R513,R514,
330 419311020010R C SMD(0402) X7R 1000PF/50V K,RoHS	TDK,WALSIN,YAGEO,	1 C607,
340 492421300100H PCB, I/F ,2/OSP /FR4/16, LE19S1 HF	EXPRESS,SHENG HUA,	1



E190Sf PCBA KP
BOM.xls

ITEM	P/N	Description	Supplier	Usage	Location
	792811500000R	PCBA,KEYPAD BOARD,LE19S1 ROHS			
10	792811540000R	PCBA,KEYPAD BOARD,SMT,LE19S1 ROHS			1
20	430602680070R	SW METAL DOME 180gf 4P D07,RoHS	FOXCONN,HUA-JIE,唯佳_BEST,		1
30	505040206500R	INSULATOR,MYLAR,KEY-PAD PCB,72.5X10.6x0.	JEOU UEI,		1
ITEM	P/N	Description	Supplier	Usage	Location
	792811540000R	PCBA,KEYPAD BOARD,SMT,LE19S1 ROHS			
10	411070033500R	LED SMD 0603 Y/G HTL-19-22VYVG C/TR8(HON HONGTONG,			1 LED1,
10	411070044500R	LED SMD 1612 Y/G KPTB-1612SYKC GKC-SZ(KI KINGBRIGHT,			0
10	411070125550R	LED Y/G 19-226A/Y5G7C-A01/2T(everlight)	EVERLIGHT,		0
20	492421500000H	PCB, K/P ,2/OSP /FR4/08, LE19S1 HF	EXPRESS,SHENG HUA,		1
30	430631080160R	WAFER 8P 1.0MM SMD V/A WITH LOCK ROHS	FCN,		1 J1,
40	411101756950R	ZENER 5.6V MMPZ5232BPT SOD323(Chenmko)Ro	CHENMKO,		2 ZD201,ZD203,
40	411100956952R	ZENER 5.6V BZT52-C5V6S SOD323(PANJIT)Ro	PANJIT,		0

Attachment 2- Schematic



E190S ST gm2621
RevA

DELL E190S only Analog Input Schematic Diagram LVDS Interface PCBA small 2 Layers PCB.

SCHEMATIC	SHEET
1.0 Contents, Revision History	1
1.1 Top Level	2
3.0 Analog Input	3
4.0 GM2621	4
5.0 Panel Interface	5
6.0 Regulator	6

Reversion of History

Rev.1 --E198 change history
 Change R421 R422 R423 R424 from 4.7K to 10K for Improve ESD
 Change R426 R428 R427 R428 from 470 to 1K for Improve ESD
 Add R520(2.2K)and R521(2.2K) for Improve H-SYNC and V-SYNC Impedance
 Change D308 from IN4148 to BAV70 and delete D307 IN4148 for decrease layout area
 Add C807 1000PF for Improve EMI
 Change register R505 ~R614 from open to mounting 510 for Improve EMI
 Add ZD403,ZD404,ZD406,ZD408 for Improve ESD
 Add C440,C441,C443,C444 for Improve EMI

Rev.2---E190S
 Change flash rom from 1M to 2M Nov.18 2008
 Change the CN401 footprint from connector to cable Dec.05 2008
 Change the zener and U402 footprint for DFX(add polar) Dec.10 2008
 Change the C802 C803 C804 footprint (from 2.0 pitch to 2.6 pitch) Dec.10 2008
 ADD ZD408 for Improve ESD Dec.18 2008, Delete Q801 R802 C808 for matching up the change of PI. Dec.10 2008

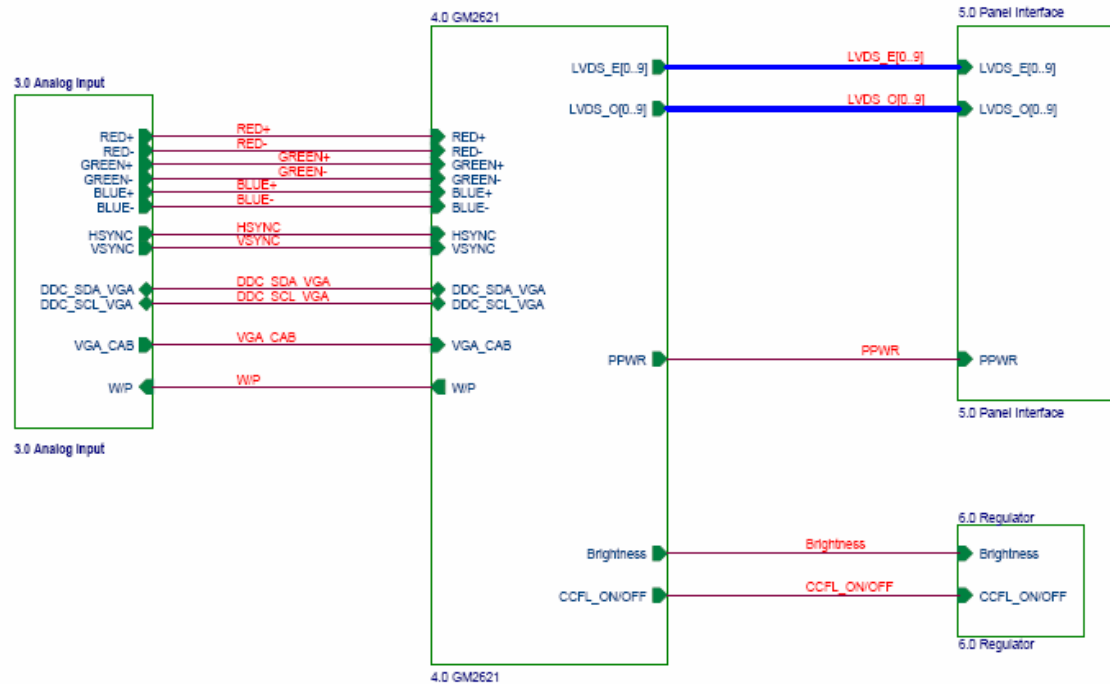
Rev.A
 Change CN801 footprint from cable to connector Jan.12 2009

FOXCONN

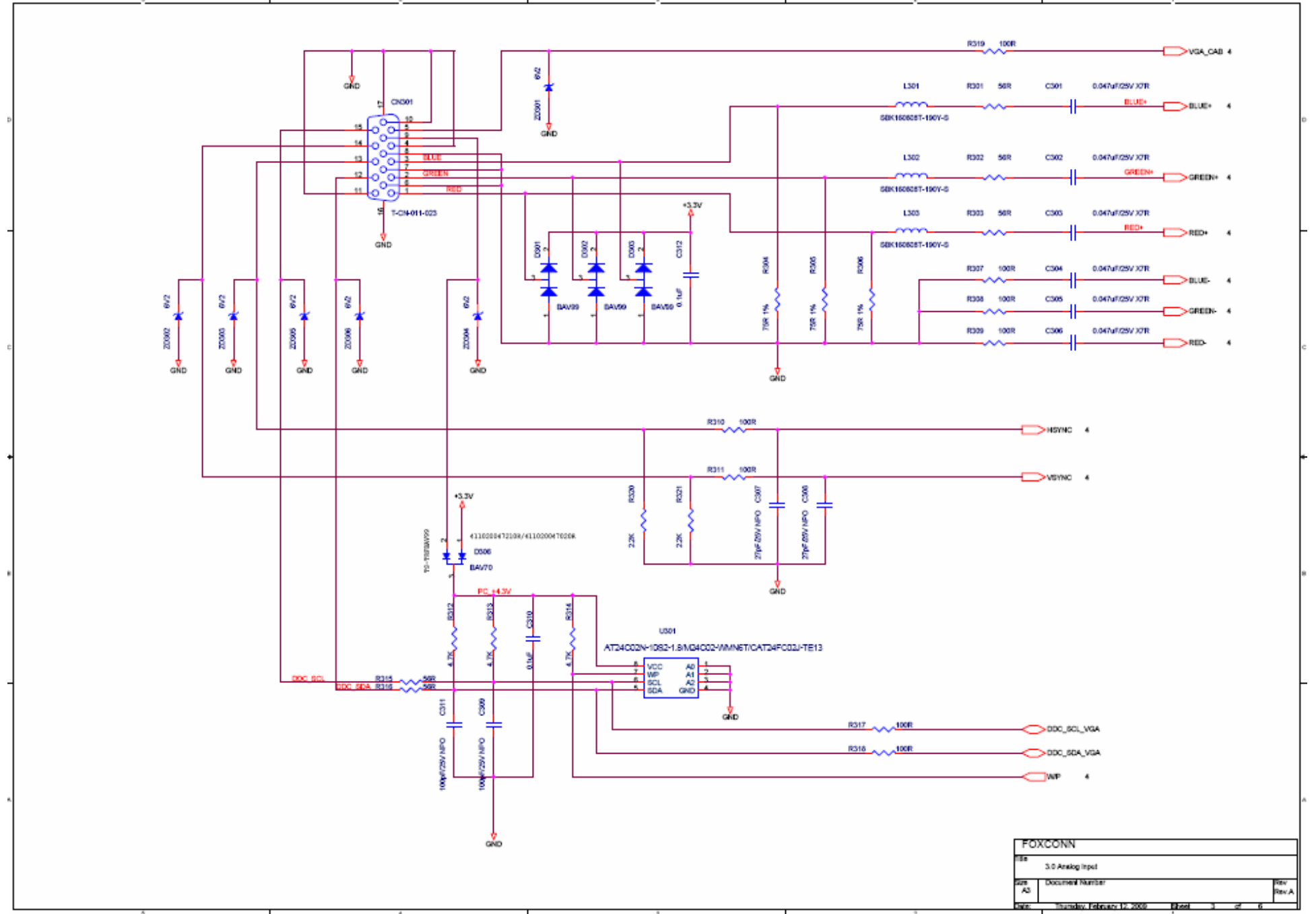
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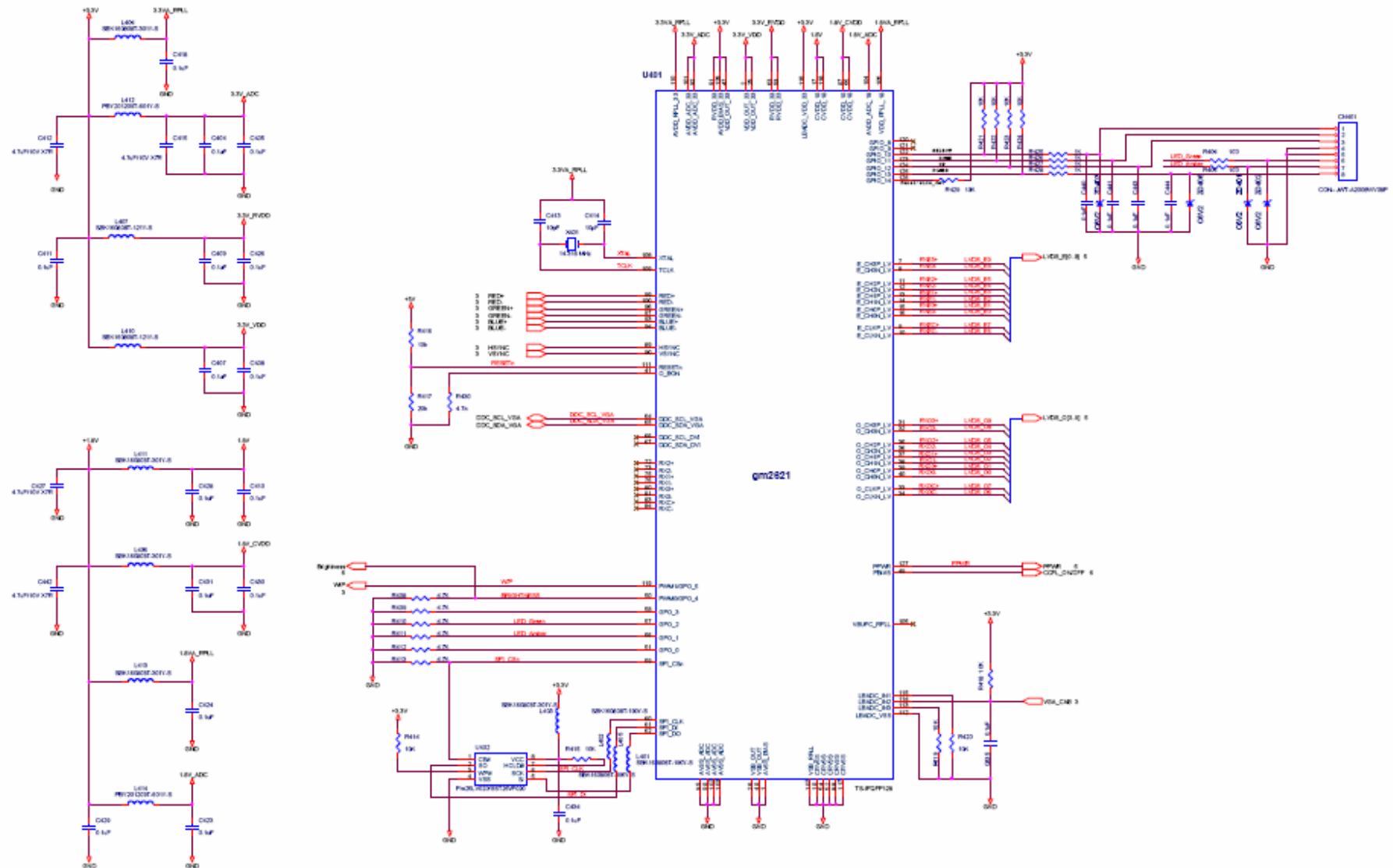
Size Custom Document Number Rev Rev.2

Date Thursday, February 12, 2009 Sheet 1 of 5

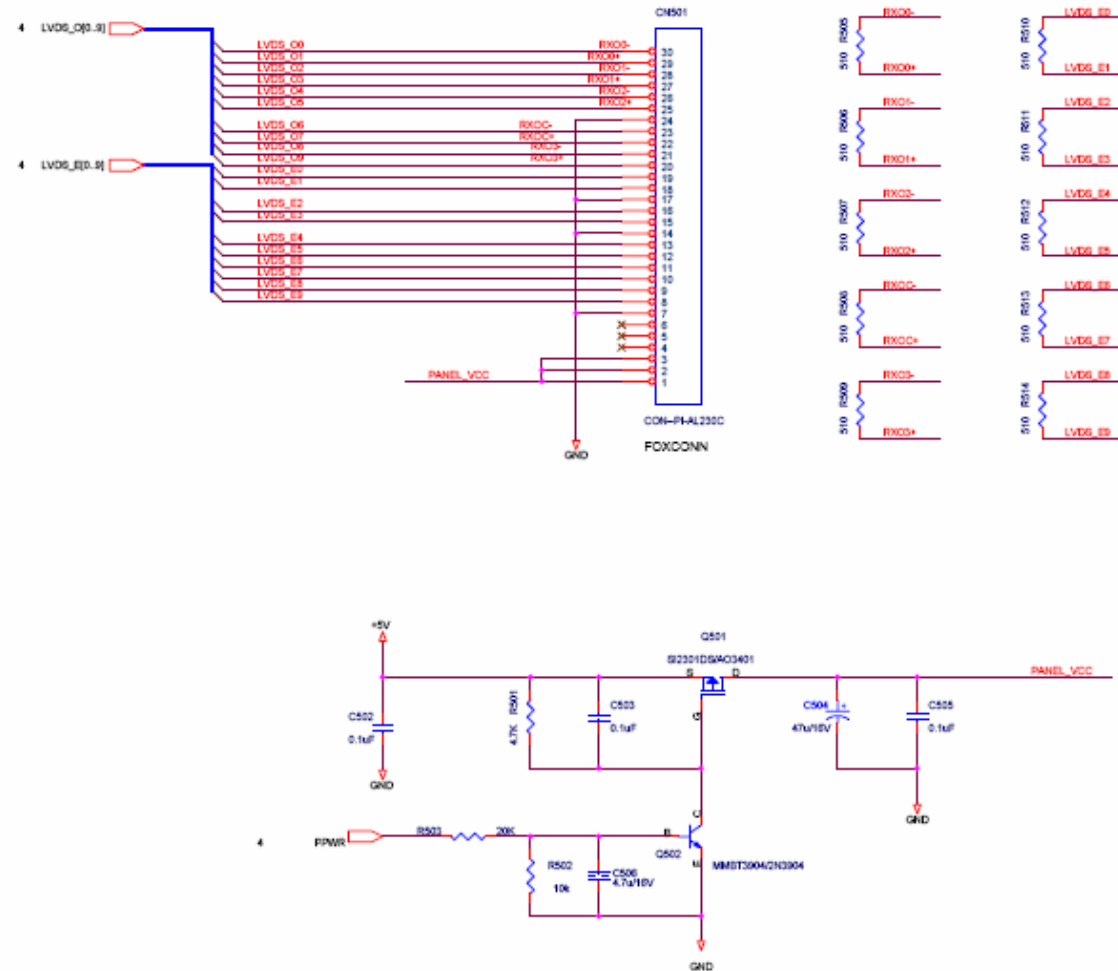


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Size A4	Document Number		Rev Rev.2
Date:	Thursday, February 12, 2009	Sheet 2 of 6	

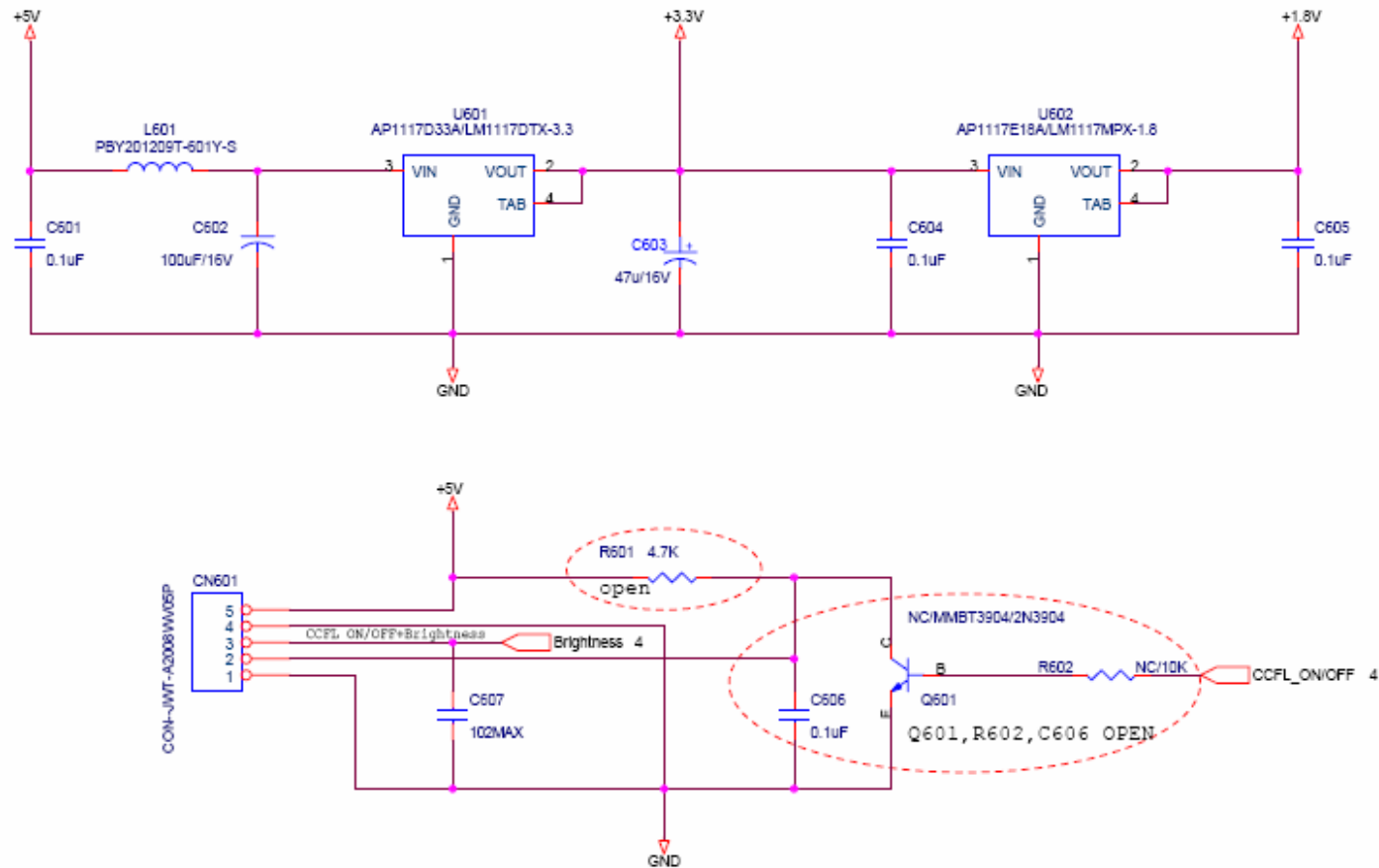




FOXC0000	
File 4.0.Dw3231	
File AL	Discarded Fluoride
Date	Thursday, February 11, 2004
Time	11:00:00



FOXCONN			
5.0 Panel Interface			
Size	Document Number	Rev	
A3		Rev A	
Date	Thursday, February 12, 2009	Sheet	5 of 8



FOXCONN		
Title		
6.0 Regulator		
Size		
A4		
Document Number		
Rev		
Rev.A		
Date: Thursday, February 12, 2009		
Sheet 6 of 6		

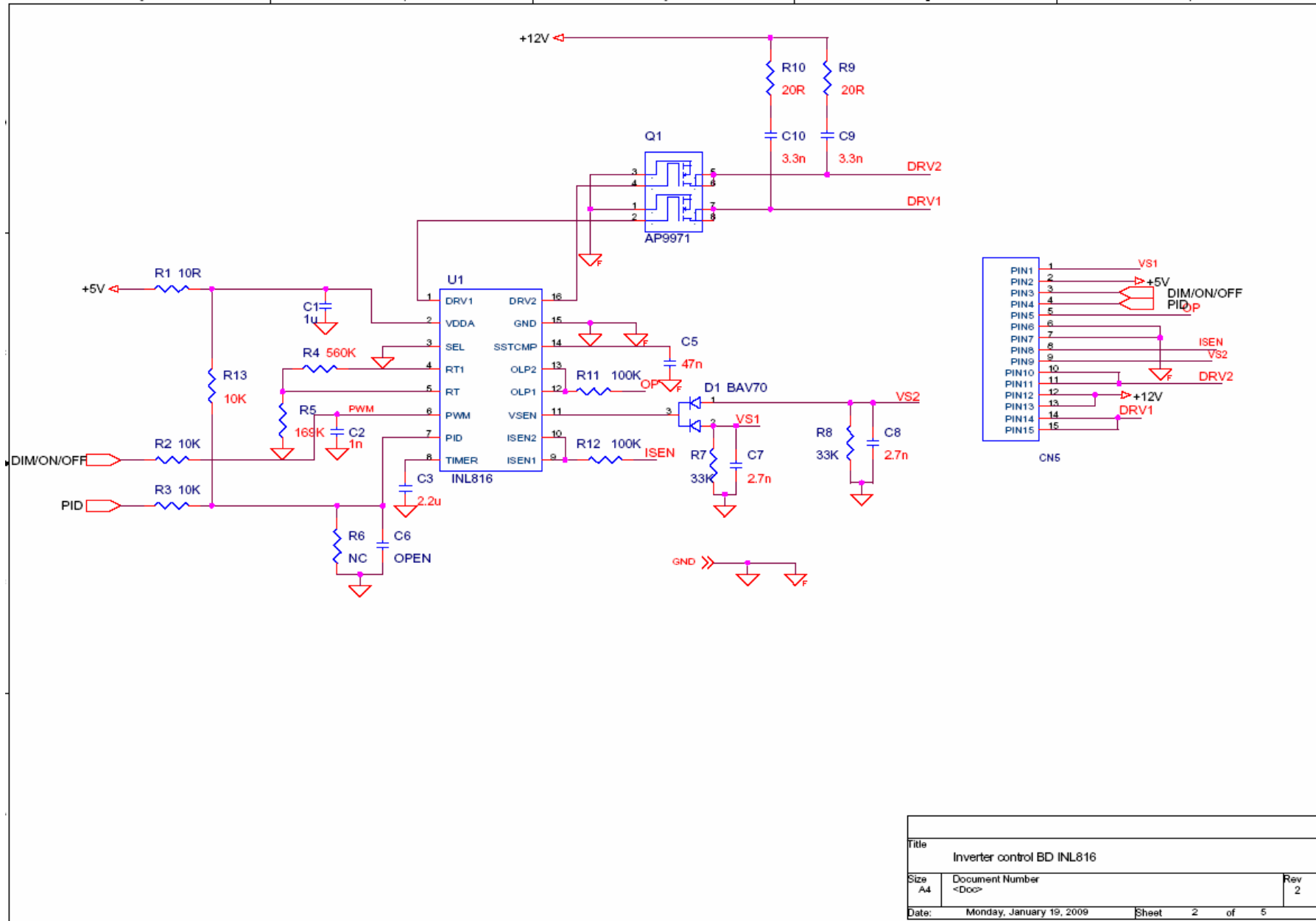
Power

Dell E190S Power/Inverter Schematic Diagram

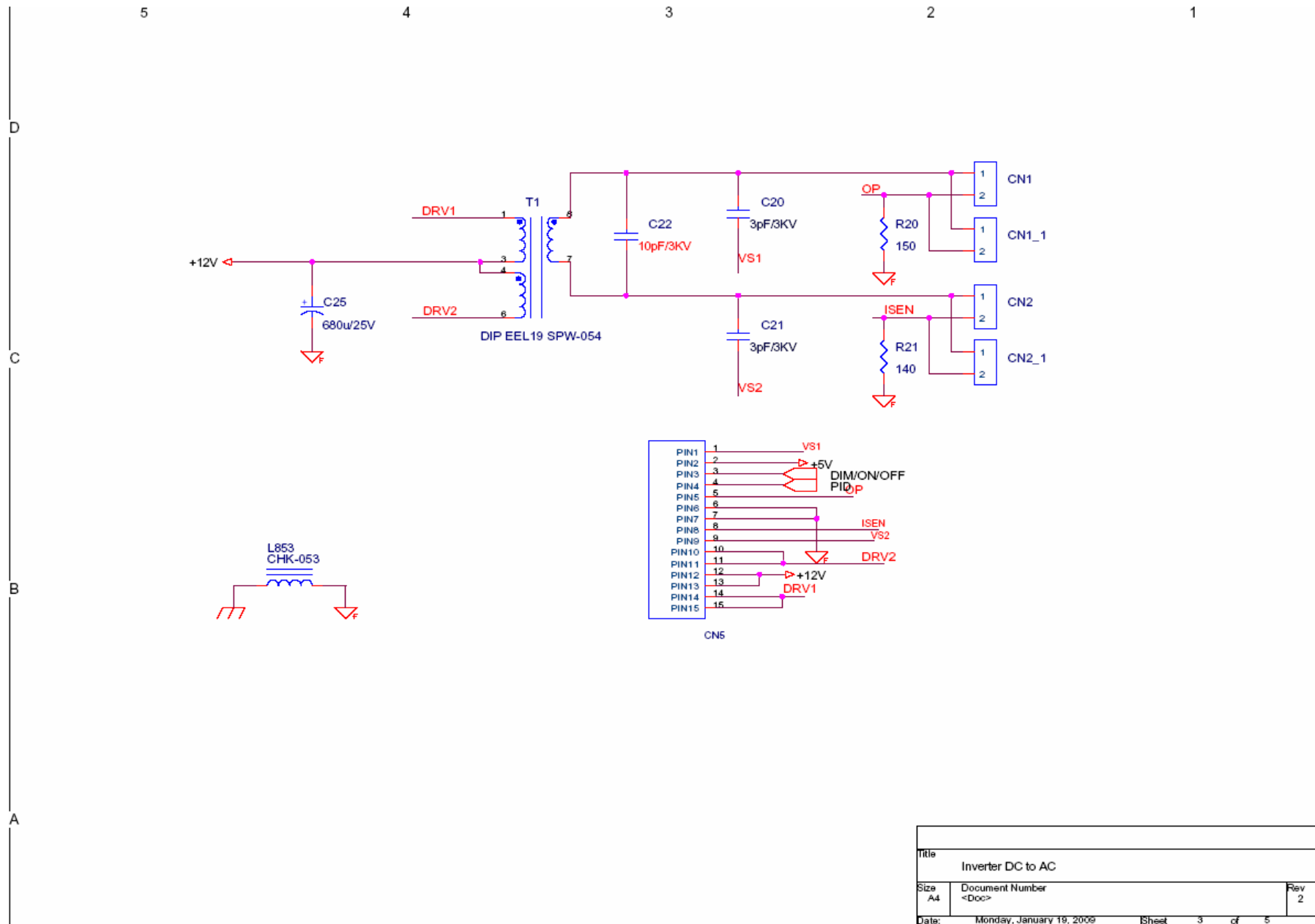
LPL/HSD PANEL

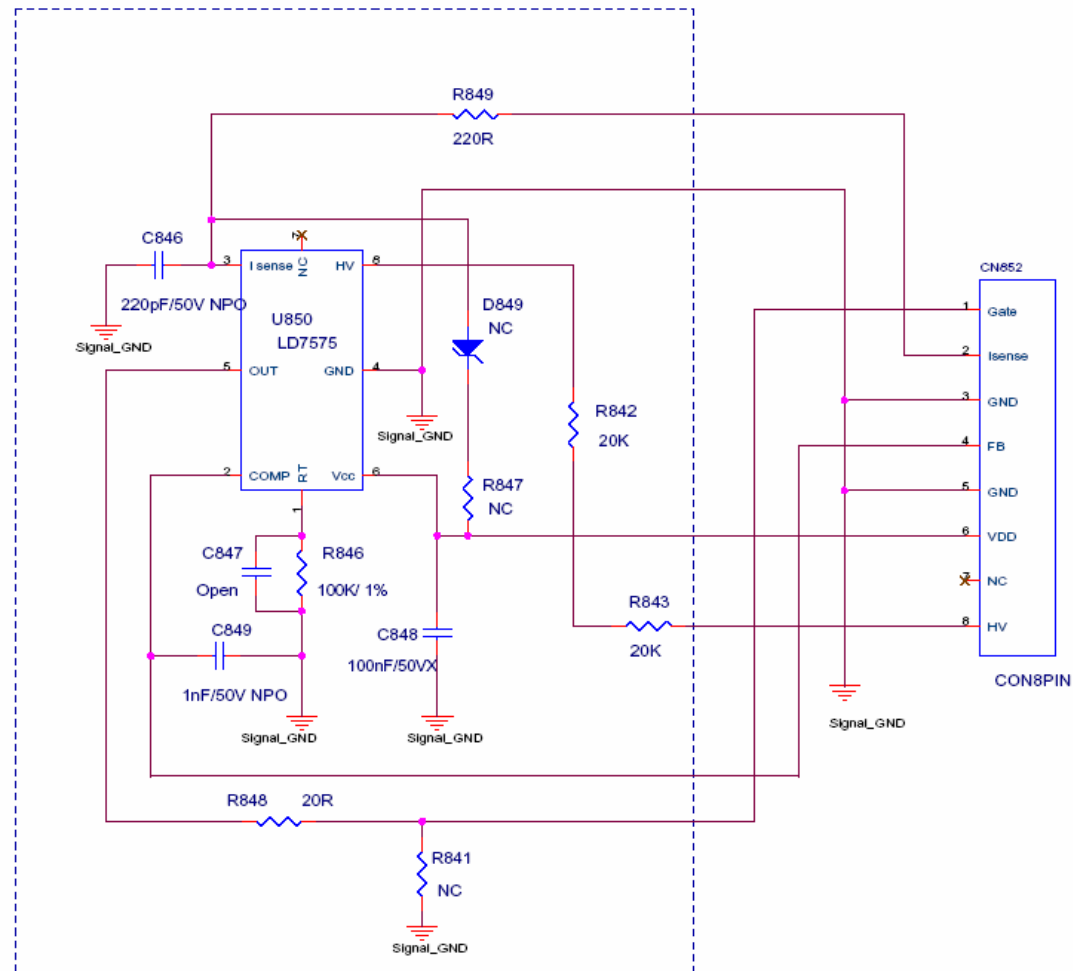
SCHEMATIC	SHEET
1.0 Contents	1
1.1 Inverter DC to AC BD	2
1.2 Inverter Control BD	3
1.3 Power AC to DC	4
1.4 Power Control BD LD7575	5

Title		
Dell E190S Power&Inverter circuit		
Size	Document Number	Rev
A	<Doc>	2
Date:	Monday, January 19, 2009	Sheet 1 of 5

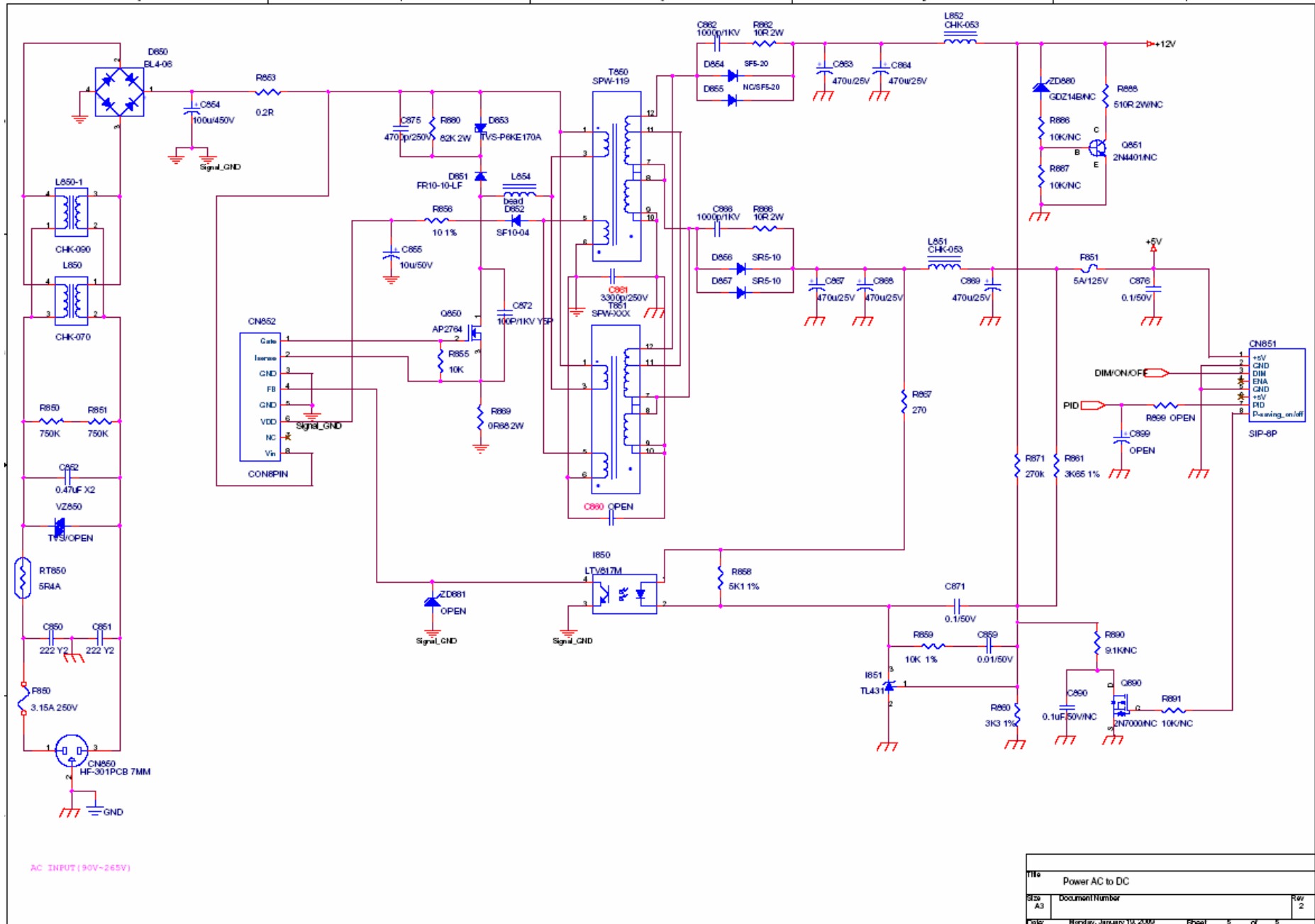


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Inverter control BD INL816		
Size	Document Number	Rev
A4	<Doc>	2
Date:	Monday, January 19, 2009	Sheet 2 of 5



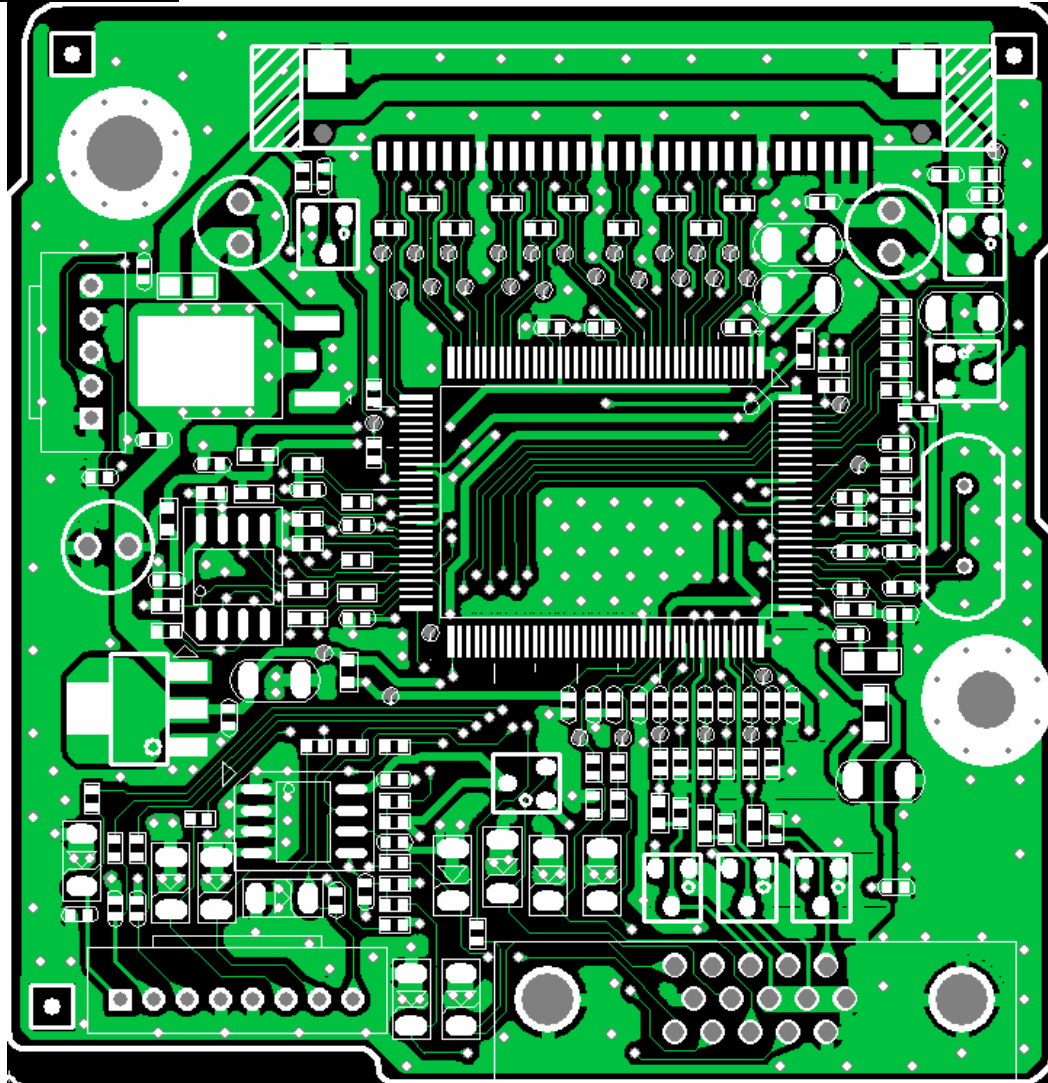


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Power control BD LD7575				
Size A4	Document Number <Doc>			Rev
Date:	Monday, January 19, 2009	Sheet	4	of 5

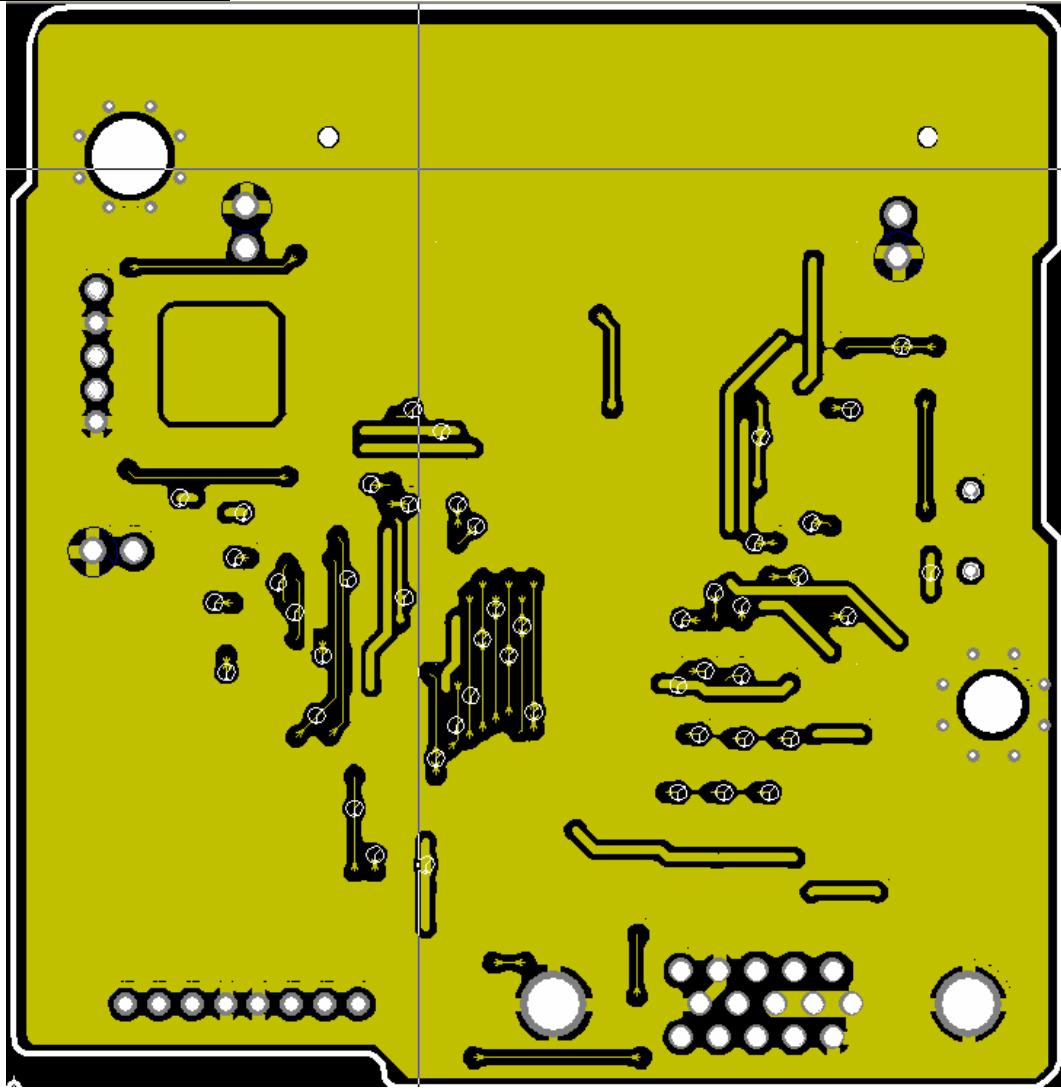


Attachment 3- PCB Layout

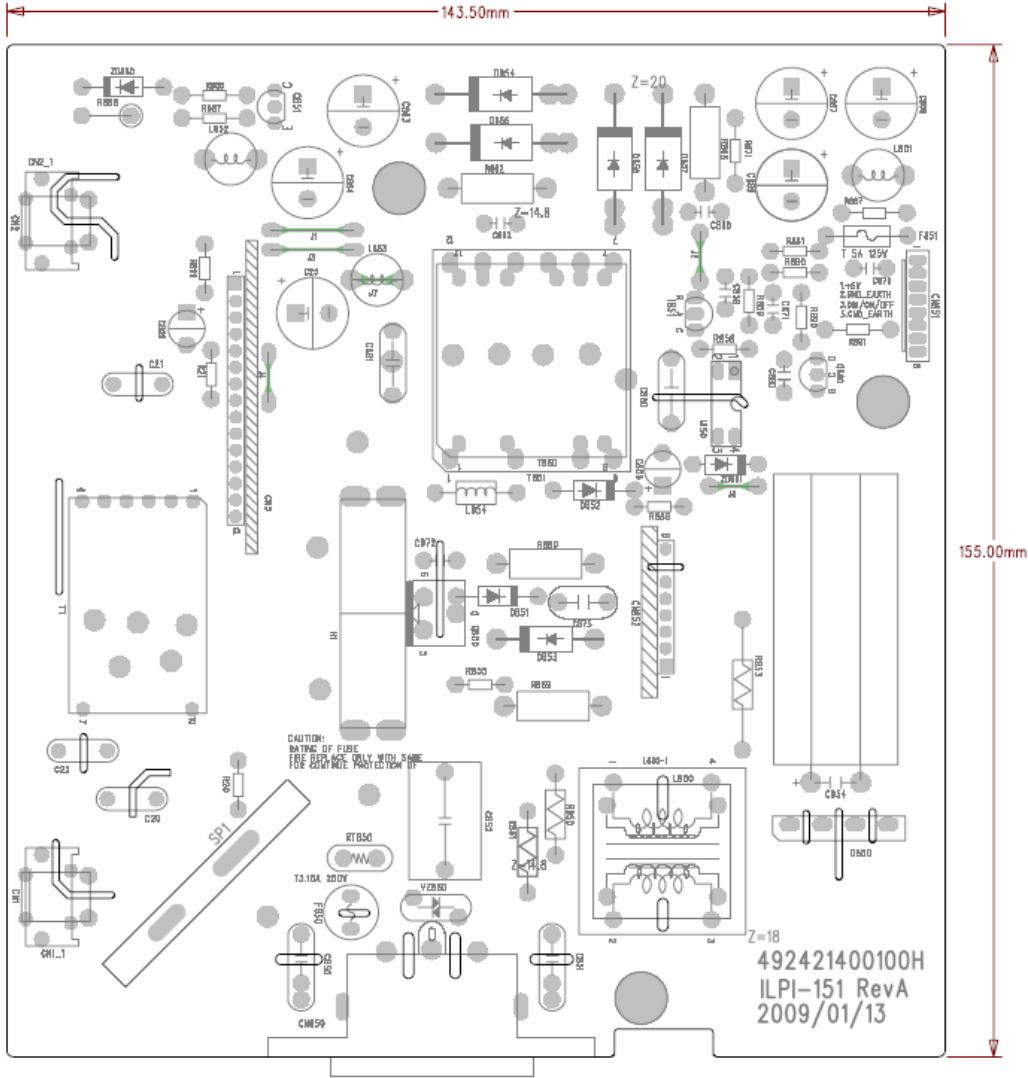
IF board Top Layer



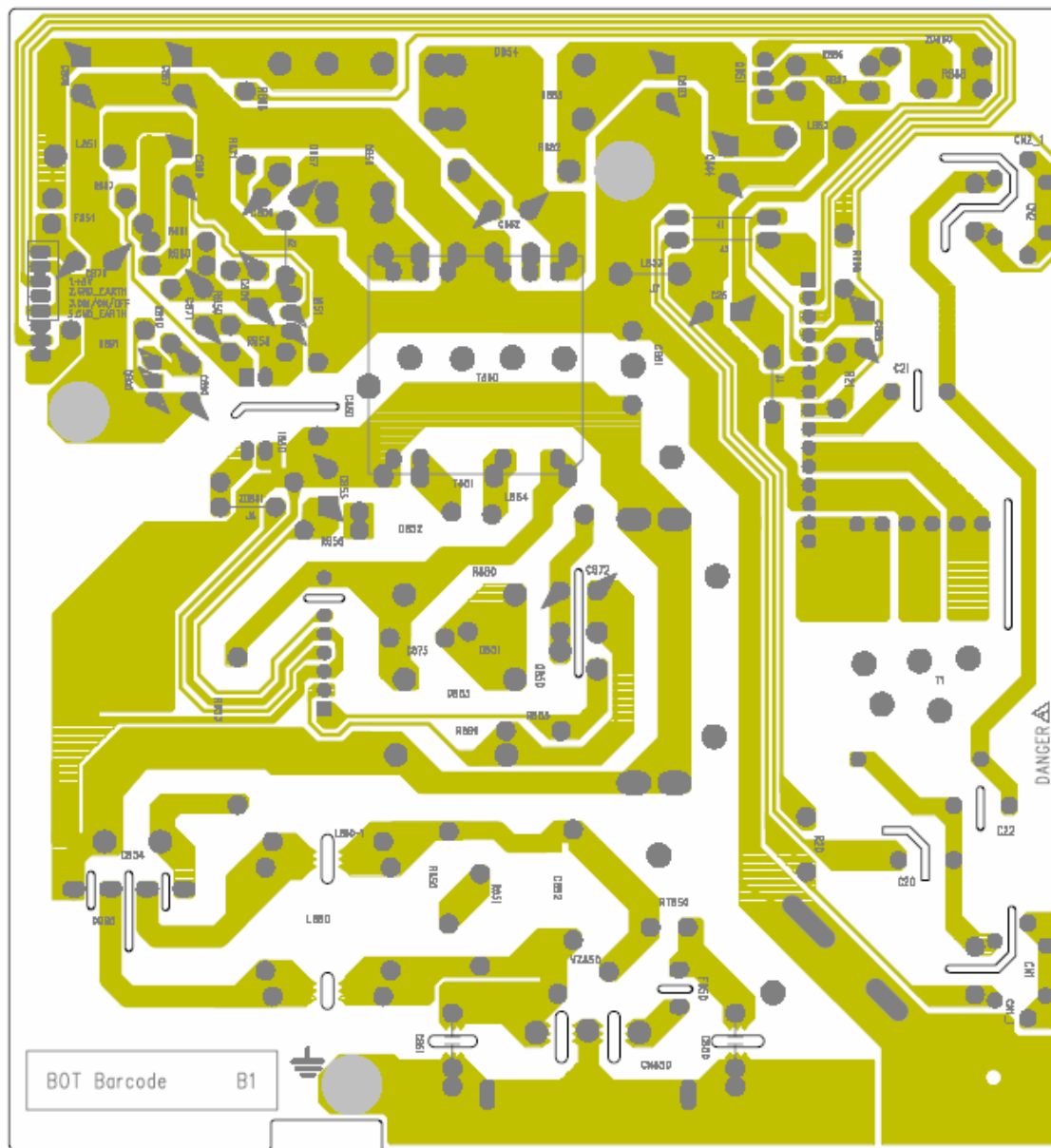
IF board Bottom Layer



power layout



Foxconn	LAYER	DRIP DRAWING			
	PCB NO	492421400100H	REV	A	DESIGNER: AppleChen
	FILE NO	ILPI-151	REMARK	2009/01/13	



Foxconn	FILE NO	ILPI-151	REMARK	2009\01\13	
	PCB NO	492421400100H	REV	A	DESIGNER: AppleChen
LAYER					
SILKSCREEN BOTTOM					